

Cumulative Subject Index¹

Volumes 73–78

A

Absorption-desorption

CO on small mica-supported

Ni, UHV studies, **73**, 91

Pd, UHV studies, **73**, 104

H₂ from supported Ni, kinetics, **73**, 272

Acetaldehyde

reactions with ethanol on

W(100) surfaces, **73**, 161

W(100) – (5 × 1)C surfaces, **73**, 161

reactions on Fe(100), **74**, 55

Acetic acid

oxidation on Co–Bi composite oxide catalysts, comparison with toluene oxidation, **78**, 217

Acetone

adsorption on silica gel, dependence of line shifts in NMR spectra of adsorbed molecules on surface coverage with complex formation, **75**, 219

hydrogen transfer reaction with ethanol over magnesium oxide, **73**, 120

reactions on Fe(100), **74**, 55

Acetophenone

condensation with formaldehyde over cation-exchange resins, hydration rate effect, **77**, 16

Acrolein

oxidation on Mo–V–W–Mn catalyst, deactivation characteristics

kinetics of activity loss, **76**, 385

kinetics of crystallization, **76**, 393

propylene oxidation on Fe₂(MoO₄)₃ doped with

Bi, **76**, 188

Te, **76**, 188

Activation energy

and ΔS[‡], general explanation for compensation effect, **78**, 238

Adsorption

and dehydrogenation of alcohols and ethers on Pt(111), **78**, 126

effects during temperature-programmed CO desorption from supported Pt, **73**, 66

formic acid on TiO₂ electron-donor centers, **74**, 89

and isomerization on tin-antimony oxide, ¹³C-NMR study, **73**, 1

NO on hydrosulfurization catalysts, infrared and volumetric study, **75**, 354

1-propanol, 1-propylamine, and 3-amino-1-propanol on plasma-grown aluminum oxides, comparison with propanoic acid and β-alanine, **78**, 96

pyridine on molybdena-alumina catalysts, **76**, 133
and reaction of 1-hexene over HY cracking catalysts, hydrogen effect, **78**, 247

β-Alanine

adsorption on plasma-grown aluminum oxides, comparison with propanoic acid, 1-propanol, 1-propylamine, and 3-amino-1-propanol, **78**, 96

Alcohols

C₁–C₄, adsorption on Pt(111), temperature-programmed reaction spectroscopy, **78**, 126

Alkali

-promoted alumina catalysts in CO + H₂O reaction, **76**, 345

Alkylation

toluene with methanol on zeolite catalysts, selectivity for xylene isomers, **75**, 196

Allyl alcohol

isomerization mechanism in Raney Ni presence, **75**, 1

Allyl alcohol-3-*d*₁

oxidative dehydrogenation over silver catalyst, stereochemistry, **75**, 404

Allyl amine

selective oxidation and ammoxidation over bismuth molybdates, probe for N₂ insertion, **75**, 225

Alumina

alkali-promoted, water-gas shift reaction, **76**, 345

Cu-oxidation states studied by redox cycles, **76**, 320

cyclohexanol dehydration, effect of preparation on catalytic activity, **78**, 1

hexene cyclization, isomerization, and cracking, **77**, 257

impregnation with thioheteroanions containing Ni or Co and Mo or W, correlation of ESR signal intensity with thiophene conversion, **76**, 466

Na-impregnated, phenolphthalein adsorption by photoacoustic spectroscopy, **75**, 262

plasma-grown, adsorption of 1-propanol, 1-propylamine, and 3-amino-1-propanol, comparison with propanoic acid and β-alanine, **78**, 96

-supported Co, Zn effect on surface properties, **74**, 121

-supported Co–Mo, NO chemisorption as probe of active precursors, **77**, 293

-supported Fe₂O₃–MoO₃, effect of support in methanol oxidation in fluidized bed reactors, **75**, 207

-supported hydrosulfurization catalysts in calcined state, NO adsorption, infrared and volumetric study, **75**, 354

¹ Boldface numbers indicate appropriate volume; lightface numbers indicate pagination.

- supported Ir
 - preparation from $\text{Ir}_4(\text{CO})_{12}$, characterization, **75**, 23
 - stoichiometry of hydrogen and CO chemisorption, **78**, 319
- supported Mo
 - n*-butene isomerization, **76**, 48
 - effect of Fe atoms on coal hydrogenation, metal-support interactions, Mössbauer and Auger spectroscopy, **78**, 454
 - 2,6-lupetidine hydrodenitrogenation under H_2 pressure, **76**, 285
 - 2,6-lutidine hydrodenitrogenation under H_2 pressure, **76**, 285
 - pyridine adsorption, **76**, 133
 - surface properties in hydrodesulfurization, **76**, 300
- supported Ni
 - morphology, **76**, 157
- supported Pt
 - CO oxidation
 - effect of diluent gases, **77**, 527
 - rate and surface coverage, ir spectroscopy, **76**, 450
 - cyclohexane and methylcyclopentane isomerization-dehydrogenation, comparison with Ir catalyst, **74**, 156
 - in ethylene hydrogenation, infrared study, **75**, 267
 - presulfurization, role in catalytic reforming and hydrogenolysis, **78**, 352
- supported Pt-Cu
 - activity and XPS studies of sulfur poisoning effect during CO oxidation, **75**, 396
- supported Pt-Ir, presulfurization, role in catalytic reforming and hydrogenolysis, **78**, 352
- supported Pt-Re
 - distribution of
 - Pt, **78**, 445
 - Re, **78**, 445
 - presulfurization, role in catalytic reforming and hydrogenolysis, **78**, 352
- supported Rh
 - CO hydrogenation, **76**, 1; **75**, 302
 - CO_2 hydrogenation, **76**, 1
- supported Ru
 - activity and selectivity in CO hydrogenation, effects of dispersion, **75**, 251
 - in ammonia decomposition, formation of infrared-active nitrogen species, **78**, 147
- supported V_2O_5
 - activity in toluene ammoxidation, **76**, 9
- tetra(neophyl)zirconium uptake during synthesis, diffusion control, **77**, 491
- thin crystalline supports, preparation by electron irradiation, characterization, **78**, 77
- $\gamma\text{-Al}_2\text{O}_3$
 - supported Co, metal-support interactions, photoacoustic spectroscopy, **78**, 360
- supported MoO_3 , characterization, reducibility of oxidic state versus hydrodesulfurization activity of sulfided state, **76**, 241
- supported Ni, metal-support interactions, photoacoustic spectroscopy, **78**, 360
- supported Pt, benzene hydrogenation, hydrogen spillover effects, **75**, 140
- supported Pt-Cu
 - CO oxidation, X-ray photoelectron spectroscopy, **74**, 307
- supported $\text{Ru}_3(\text{CO})_{12}$
 - surface properties
 - full decarbonylation and reduction, **74**, 252
 - interaction with hydroxylated surface, **74**, 225
 - surface characterization
 - structure and reactivity of surface carbonylic complexes, **74**, 240
- supported WO_3 , characterization, reducibility of oxidic state versus hydrodesulfurization activity of sulfided state, **76**, 241
- Aluminum chloride
 - supported, *n*-butane isomerization catalyzed by, **78**, 436
- Aluminum chloride/sulfonic acid resin
 - n*-butane disproportionation catalyzed by, **76**, 440
 - n*-pentane disproportionation catalyzed by, **76**, 440
- Aluminum phosphate catalyst
 - Al_2O_3 - and - SiO_2 -supported Pd, preparation and comparison of catalytic activity for reduction of nitrobenzene by hydrogen transfer, **78**, 188
 - butene isomerization, **76**, 235
- 3-Amino-1-propanol
 - adsorption on plasma-grown aluminum oxides, comparison with propanoic acid and β -alanine, **78**, 96
- Ammonia
 - decomposition over
 - CaO , formation of infrared-active nitrogen species, **78**, 147
 - MgO , formation of infrared-active nitrogen species, **78**, 147
 - $\text{Ru-Al}_2\text{O}_3$, formation of infrared-active nitrogen species, effect of Ru, **78**, 147
 - Ru-MgO , formation of infrared-active nitrogen species, effect of Ru, **78**, 147
 - reaction with NO on V_2O_5 , kinetics by pulse technique, **74**, 144
 - synthesis on
 - iron single crystals, effect of surface structure on catalyst activity, **74**, 129
 - osmium powder and hydrogenation of preadsorbed N_2 from 100 to 500°C , **74**, 110
 - probe reaction for study of supported Re and RePt, **77**, 57
 - over rhenium, effects of water and surface sulfur on activity, **78**, 142
 - surface composition of promoted iron catalysts, Auger electron spectroscopy, **77**, 208

Ammoxidation

- allyl amine oxidation over bismuth molybdates, **75**, 225
- 3-picoline, acid-base properties and ir spectra of V-Ti-O catalysts, **76**, 144
- propylene
 - catalyst optimal composition and reaction selectivity, **75**, 375
 - (Te-Ce)O structure and activity, **75**, 134
- toluene over V_2O_5/Al_2O_3 , catalyst activity, **76**, 9
- ketones to oximes by silica, **73**, 57

Aromatics

- formation from synthesis gas, role of carbon and oxygen in activation of iron Fischer-Tropsch catalyst at low pressures, **78**, 24
- hydrogenation catalyzed by sulfided CoO-MoO₃/γ-Al₂O₃, **73**, 45

Auger electron spectroscopy

- surface composition of promoted iron catalyst for ammonia synthesis, **77**, 200

B**Benzene**

- cyclohexane dehydrogenation on Te NaX zeolites, D tracer studies, **73**, 361
- hydrogenation over
 - Ni catalysts, structure sensitivity and copper alloying effects, **75**, 233
 - Pt/γ-Al₂O₃, hydrogen spillover effects, **75**, 140
- interaction with Ni, neutron inelastic spectroscopy study, **74**, 296

Benzoic acid

- reduction on Y₂O₃ in infrared spectroscopic flow reactor, **76**, 274

Benzothiophene

- hydrodesulfurization, bifunctional character of hydrorefining catalysts, **73**, 406

1,1'-Binaphthyl

- optically active, racemization and reduction by Raney Ni, **74**, 275

Bipyridyl

- Co ratio, 1,3-diolefin catalytic hydrogenation, **73**, 228

Bismuth molybdate

- Bi₂MoO₆, allyl amine selective oxidation and ammoxidation, probe for N₂ insertion, **75**, 225
- Bi₂Mo₃O₁₂, allyl amine selective oxidation and ammoxidation, probe for N₂ insertion, **75**, 225
- γ'-Bi₂O₃ · MoO₃ polymorph, **73**, 357

Book reviews

- Chemistry in Two Dimensions: Surfaces. G. A. Somorjai, 1981, **77**, 567
- Diffusion in Gases and Porous Media. R. E. Cunningham and R. J. Williams, 1980, **74**, 413
- Frontiers of Free Radical Chemistry. William A. Pryor (Ed.), 1980, **74**, 413

- Homogeneous Transition-Metal Catalysis-A Gentle Art. Christopher Masters, 1981, **76**, 477

Boron-phosphorus-oxygen

- cis-methylcyclopentanol dehydration, **75**, 94
- trans-2-methylcyclopentanol dehydration, **75**, 94

Brönstein acid groups

- combination with AlCl₃, n-butane isomerization, **78**, 436

Bronzes

- hydrogen molybdenum oxide, ethylene hydrogenation, **73**, 309

Butadiene

- reduction on Pt/C catalysts suspended in aqueous solution, **74**, 323

1,3-Butadiene

- hydrogenation
 - over La₂O₃, mechanistic study, **76**, 65
 - over Ni catalysts, surface state, catalytic activity, and selectivity, electronic effects, **74**, 173
- liquid-phase diacetoxylation with Rh-Te-C catalyst, **76**, 354

n-Butane

- disproportionation catalyzed by aluminum chloride/sulfonic acid resin, **76**, 440
- hydrogenolysis over Ir/TiO₂, metal-support interactions, **78**, 406
- isomerization catalyzed by supported AlCl₃, **78**, 436

Butenes

- isomerization
 - over aluminum phosphate catalyst, **76**, 235
 - by atomic Mg, **75**, 425
 - by atomic Ni, **75**, 425
 - over MoS₂ single crystal catalysts, regulation by conformation of active sites, **78**, 155
- reduction on Pt/C catalysts suspended in aqueous solution, **74**, 323
- selective oxidation on iron oxide, oxygen effect, **77**, 410

1-Butene

- adsorption and isomerization on tin-antimony oxide catalysts, ¹³C-NMR study, **73**, 1
- interaction with β-VOPO₄, temperature-programmed desorption, **75**, 112
- interaction with V₂O₅, temperature-programmed desorption, **75**, 112
- isomerization
 - on supported Pd, Ni, and Pd-Ni alloys, comparison, **76**, 169
 - over reduced Mo/Al₂O₃, **76**, 48

tert-Butyl chloride

- dehydrochlorination over mixed copper chlorides, catalytic activity, WER, IR, and mechanistic studies, **78**, 51

γ-Butyrolactone

- tetrahydrofuran vapor-phase oxidation over V₂O₅-SiO₂ catalyst, kinetics and XRD, **77**, 192

C

- Calcium oxide
 in ammonia decomposition, formation of infrared-active nitrogen species, **78**, 147
 -supported Ru in ammonia decomposition, formation of infrared-active nitrogen species, **78**, 147
- Calcium phosphates
 ethanol decomposition, catalytic behavior, **75**, 200
 2-propanol decomposition, catalytic behavior, **75**, 200
- Calorimetry
 mathematical model for characterization of catalyst with skewed unimodal acid strength distribution, **76**, 294
- Carbene
 hydrocarbon formation from methanol over zeolite catalysts, **74**, 203
- Carbon
 active, oxidation over Co-La₂O₃-Pt, enhancement of oxygen transmission, **76**, 84
 catalytic reactivity of Fe, FeO, and Fe₂O₃
 in acetylene formation, **77**, 74
 in ethane formation, **77**, 74
 role in activation of iron Fischer-Tropsch catalyst at low pressures, **78**, 24
 role in catalytic reactions, use of C-13 tracer, **74**, 405
 -supported iron catalysts
 in CO hydrogenation, **75**, 416
 in Fischer-Tropsch synthesis, chemisorption, magnetization, and Mössbauer spectroscopy, **76**, 208
 surface
 interaction with water, role of hydrogen, **77**, 297
 use of C-13 tracer experiments to determine role, **74**, 405
 uncatalyzed and Pt-catalyzed gasification by H₂O and CO₂, **75**, 337
- Carbon dioxide
 effects on catalytic methanol synthesis from CO/H₂, **74**, 343
 hydrogenation
 on Ni/SiO₂, kinetics and mechanism, **77**, 460
 Rh catalysts on various metal oxides, **76**, 1
 /water, uncatalyzed and Pt-catalyzed carbon gasification, **75**, 337
- Carbon monoxide
 adsorption
 on Fe/MgO, ir spectroscopy, **77**, 550
 geometric and ligand effects in ir spectra, **73**, 50
 Pt/SiO₂, infrared spectroscopy, **78**, 461
 Ru(001), water-induced effects, **74**, 192
 during temperature-programmed desorption from supported Pt, **73**, 66
 catalytic oxidation on Ni-Y, **77**, 561
 desorption from Ni sites on Ni-rich(110) Cu-Ni surface, work function as monitor for thermal desorption spectroscopy, **73**, 288
 hydrocarbons, and oxygenates, relative hydrogenation rates, **77**, 558
 hydrogenation over
 carbon-supported iron catalysts, **75**, 416
 catalytic methanol synthesis, CO₂ effects, **74**, 343
 chemisorption on Ir/ γ -Al₂O₃, stoichiometry, **78**, 319
 on Fe₂O₃, changes in catalyst surface structure and composition, **75**, 39
 kinetics on polycrystalline Ni foils, **77**, 1
 LaRhO₃, formation of oxygen-containing organic molecules, **74**, 282
 over molybdenum/charcoal catalysts, **78**, 116
 over Ni catalyst
 deuteromethane tracing, **75**, 314
 sulfur deactivation, **76**, 369
 Pd/Al₂O₃, ir spectroscopy, **74**, 44
 reversible chemisorption on highly dispersed Y-zeolite -supported catalyst, **78**, 182
 Rh catalyst, **75**, 78
 Ru using transient response techniques, **73**, 257
 Ru/Al₂O₃
 effects of dispersion on catalytic activity and selectivity, **75**, 251
 kinetic behavior and H₂S tolerance, **74**, 332
 over Ru/SiO₂, detection of surface species by reaction scavenging, **78**, 165
 side effects in Fischer-Tropsch synthesis, **77**, 141
 Ti-supported metals, **74**, 199
 /H₂O on
 alkali-promoted alumina catalysts, **76**, 345
 over Rh catalysts on metal oxides, **75**, 302; **76**, 1
 interaction with mica-supported
 Ni particles, UHV studies, **73**, 91
 Pd, UHV studies, **73**, 104
 oxidation
 catalytic contribution of lattice oxygen atoms of praseodymium oxide, **76**, 61
 over FeY
 with NO, comparison with FeM, kinetics and mechanism, **78**, 327
 with N₂O, comparison with FeM, kinetics and mechanism, **78**, 327
 with O₂, comparison with FeM, kinetics and mechanism, **78**, 327
 over Pt/alumina
 effect of diluent gases, **77**, 527
 effect of metal dispersion, **74**, 408, 411
 surface coverage, ir spectroscopy, **76**, 450
 over Pt-Cu/ γ -Al₂O₃
 activity and XPS studies of sulfur poisoning effect, **75**, 396
 X-ray photoelectron spectroscopy, **74**, 307
 Pt/silica, infrared study, **75**, 275
 temperature-programmed desorption, adsorption effects from supported Pt, **73**, 66

Carbon number distribution

Fischer-Tropsch products formed on iron catalyst in slurry reactor, **73**, 187

Carbon tetrachloride

hydrodechlorination and oligomerization over Ni Y zeolites, **74**, 136

Carbonyl compounds

photoactivated transition metal-catalyzed hydrosilylation, **78**, 111

Catalytic activity

N₂O decomposition on Ni²⁺, Co²⁺, and Cr³⁺ in solid solutions, **74**, 1

Cations

catalytic behavior in solid solution, electrostatic potential approach, **73**, 387

Charcoal

pellet, simultaneous diffusion and adsorption of chloroplatinic acid during preparation of supported Pt catalyst, **77**, 248

Rh-Te in 1,3-butadiene liquid-phase diacetoxylation, **76**, 354

-supported molybdenum, reactions of carbon monoxide with hydrogen, **78**, 116

Chemisorption

H₂ on ZnO, temperature-programmed desorption and infrared spectroscopy, **73**, 396

NO as probe of active precursors in Co-Mo/Al₂O₃, **77**, 293

oxygen, characterization of unsupported Ni-Mo hydrodesulfurization catalysts, **78**, 253

site-selective, NO and CO₂ over molybdena-alumina, **77**, 221

Chlorine

effect on catalytic behavior of

Ag clusters, **73**, 171

Pt clusters, **73**, 171

Chlorobenzene

hydrolysis over Cu-promoted hydroxyapatites, **77**, 64

Chloroplatinic acid

simultaneous diffusion and adsorption in charcoal pellet during preparation of supported Pt catalyst, **77**, 248

Chromate

Cr(VI) state on Phillips polymerization catalyst, saturation coverage, **76**, 29, 37

Chromia

copper-chromium oxide catalysts, ¹H-NMR study of hydrogen species, **76**, 231

/silica

hydrogenation of olefins and polymerization of ethene, **77**, 360

XPS study, **77**, 348

use of organic probes in detecting active sites, **78**, 1

Chromyl chloride

vapor, interaction with hydroxyl population on calcined silica, Cr(VI) state, **76**, 17

Clays

surfaces, catalyzed thermal decomposition of cyclohexyl esters, dimerization of propenylbenzenes, lactonization of cyclo-octene-5-carboxylic acid, **78**, 197

Cobalt

alumina-supported

in calcined state, NO adsorption, infrared and volumetric study, **75**, 354

metal-support interactions, photoacoustic spectroscopy, **78**, 360

Zn effect on surface properties, **74**, 121

combined X-ray photoelectron and Mössbauer emission spectroscopy in sulfided, supported, and unsupported Co-Mo catalysts, **77**, 397

Cobalt-bipyridyl complexes

1,3-diolefin hydrogenation, **73**, 228

Cobalt-bismuth

oxidation of acetic acid and toluene, comparison, **78**, 217

Co-La₂O₃-Pt

in active C oxidation, enhancement of oxygen transmission, **76**, 84

Cobalt-molybdenum

alumina-supported, NO adsorption

infrared and volumetric study, **75**, 354

as probe of active precursors, **77**, 293

oxygen chemisorption on sulfided catalysts for thiophene hydrodesulfurization and hexene hydrogenation, **77**, 432

sulfided

hydrogenation of aromatic compounds catalyzed by, **73**, 45

supported and unsupported, X-ray photoelectron and Mössbauer emission spectroscopy of Co state, **77**, 397

unsupported catalysts, origin of catalytic synergy, **77**, 564

Co-Ni sulfide catalysts

in propene hydrogenation, **76**, 164

Cobalt sulfide

hydrogenation and hydrodesulfurization activity, effect of treatment with triethylaluminum, **77**, 132

Cobalt tetraphenylporphyrin

/TiO₂, NO_x reduction, kinetics, **77**, 519

Compensation effect

relationship between ΔS- and activation energy, **78**, 238

Copper

-catalyzed hydrocarbon oxidation on ZSM-5 zeolite as shape-selective support, **77**, 301

-chromium oxide catalysts, ¹H-NMR study of hydrogen species, **76**, 231

effect on catalytic behavior of

Ag clusters, **73**, 171

Ni catalysts during benzene hydrogenation, **75**, 233

Pt clusters, **73**, 171

- Ni monolayer deposition, interaction with oxygen, XPS study, **77**, 200
 oxidation states on alumina studied by redox cycles, **76**, 320
 -promoted hydroxyapatites, chlorobenzene hydrolysis, **77**, 64
 Pt-Cu/ γ -Al₂O₃, CO oxidation, X-ray photoelectron spectroscopy, **74**, 307
 -Raney catalyst, hexadecyl chloride dehydrohalogenation, **75**, 49
 -silica, hexadecyl chloride dehydrohalogenation, **75**, 49
- Copper²⁺**
 -smectite catalyst in 1-hexene conversion, **75**, 190
- Copper chloride**
 mixed, catalytic activity, ESR, IR, and mechanistic studies of dehydrochlorination of *tert*-butyl chloride, **78**, 51
- Copper chromite**
 hexadecyl chloride dehydrohalogenation, **75**, 49
- Copper-nickel**
 Ni-rich(110) surface, CO desorption from Ni sites, work function as monitor for thermal desorption spectroscopy, **73**, 288
- Coprecipitation**
 γ -Bi₂O₃ and α -Bi₂O₃ · 3MoO₃ preparation, **73**, 357
- Cracking**
 isomerization, and disproportionation of *n*-heptane on Cr-exchanged Y zeolite, kinetics, **77**, 159
- Cyclohexane**
 dehydrogenation to benzene on Te NaX zeolites, D tracer studies, **73**, 361
 and methylcyclopentane isomerization-dehydrogenation over Pt and Ir catalysts, **74**, 156
- Cyclohexanol**
 catalytic transformations on group V111 metal catalysts, **74**, 31
 dehydration over alumina, effect of preparation on catalytic activity, **78**, 1
- Cyclohexyl esters**
 thermal decomposition, propenylbenzene dimerization, and lactonization of cyclo-octene-5-carboxylic acid at clay surfaces, **78**, 197
- Cyclo-octene-5-carboxylic acid**
 lactonization, thermal decomposition of cyclohexyl esters, and propenylbenzene dimerization at clay surfaces, **78**, 197
- D**
- Deactivation**
 kinetics for heterogeneous catalyst, direct determination, reactor design, **73**, 366
 Mo-V-W-Mn acrolein oxidation catalyst
 kinetics of activity loss, **76**, 385
 kinetics of crystallization, **76**, 393
- Dealkylation**
 steam, toluene over group V111 catalysts, role of support, **75**, 151
- Dehydration**
 cyclohexanol conversion over alumina, effect of preparation on catalytic activity, **78**, 1
 formic acid on TiO₂, nature of active centers, **74**, 77, 89
 methanol over sulfonated poly(styrene-divinylbenzene), effect of physical properties on kinetics, **74**, 373
cis-methylcyclopentanol on B-P-O catalysts, **75**, 94
trans-methylcyclopentanol on B-P-O catalysts, **75**, 94
- Dehydrogenation**
 alcohols and ethers on platinum(111), **78**, 126
 cyclohexane to benzene on TeNaX zeolites, deuterium tracer studies, **73**, 361
 isopentane over silica-alumina, activity and product distribution, **75**, 410
 methyl cyclohexane, fouling of Pt reforming catalyst, **73**, 377
 oxidative
 allyl alcohol-3-*d*₁ over silver catalyst, stereochemistry, **75**, 404
 ethylbenzene on Na-SiO₂ · Al₂O₃, catalytic activity and properties, **75**, 56
 styrene formation from ethylbenzene, **75**, 66
- Dehydrohalogenation**
 hexadecyl chloride on copper catalysts, **75**, 49
- Density**
 acid site, measurement on molybdenum sulfide catalyst, **78**, 469
- Desorption**
 CO from Ni sites on Ni-rich(110) Cu-Ni surface, work function as monitor for thermal desorption spectroscopy, **73**, 288
 temperature-programmed
 acidity measurement, **74**, 196
 of CO from supported Pt, adsorption effects, **73**, 66
 design parameters, **75**, 164
 ir spectroscopy of H₂ chemisorption, **73**, 396
- Diacetoxylation**
 1,3-butadiene with Rh-Te-C catalyst in liquid phase, **76**, 354
- Dienes**
 and trienes, hydrocyanation over nickel(0)-phosphite complexes, **78**, 209
- Differential cation exchange capacity**
 nickel supported on silica-aluminas, **78**, 88
- Diffusion**
 pore, effect in enantioselective hydrogenation with supported Ni catalysts, **76**, 316
- di-2-Hexyl ether**
 1-hexene conversion over Cu²⁺-smectite catalyst, **75**, 190

- Dimerization
propenylbenzene, thermal decomposition of cyclohexyl esters, and lactonization of cyclo-octene-5-carboxylic acid, **78**, 197
- Dimethylbutenes
isomerization over stoichiometric metal phosphates (Al, Cr, Fe, Co, Ni, and Bi), comparison, **76**, 182
- 1,3-Diolefins
selective hydrogenation catalyzed by Co-bipyridyl complexes, **73**, 228
- Dispersion
metal, CO oxidation on supported Pt catalysts, **74**, 408, 411
- Dithiomolybdate
stability in H₂S presence, ESR study, **76**, 473
- Dithionitogstate
stability in H₂S presence, ESR study, **76**, 473
- Drying temperature
effect on temperature-programmed reduction profile of Pt/Rh/Al₂O₃, **77**, 43
- Dynamic pulse method
measurement of metal surface areas, **76**, 75
- E
- Electrical conductivity
Pt/TiO₂, metal-support interactions, **78**, 425
- Electronegativity
zeolites, catalytic properties, **73**, 205
- Electron exchange
between silver and TiO₂, **76**, 254
- Electronic structure
N₂O decomposition on Ni²⁺, Co²⁺, and Cr³⁺ in solid solutions, **74**, 1
- Electron irradiation
characterization of thin crystalline alumina supports prepared by, **78**, 77
- Electron spectroscopy for chemical analysis, *see* X-ray photoelectron spectroscopy
- Electron spin resonance
supported and unsupported molybdenum hydro-treating catalysts, **78**, 380
- Electrostatic potential
catalytic behavior of cation in solid solutions, **73**, 387
- Enantioselectivity
Ni catalysts modified with tartaric acid, effect of preparation variables, **74**, 382
- Equations
selectivity, networks for hydrogenolysis reactions, **78**, 419
- Ethane
hydrogenolysis over
Pt-Fe/SiO₂, kinetics and mechanism, **74**, 207
Pt/SiO₂, kinetics and mechanism, **74**, 207
- Ethanol
decomposition, calcium phosphate catalytic behavior, **75**, 200
- hydrogen transfer reaction with acetone over magnesium oxide, **73**, 120
- reactions with acetaldehyde
on W(100), **73**, 161
on W(100) - (5 × 1)C surfaces, **73**, 161
- Ethene
polymerization over CrO_x/SiO₂, **77**, 360
- Ethers
C₁-C₅, adsorption on Pt(111), temperature-programmed reaction spectroscopy, **78**, 126
- Ethyl acetate
reesterification with *n*-propanol over sulfonated poly(styrene-divinylbenzene) catalysts, **74**, 361
- Ethylbenzene
oxidative dehydrogenation
on Na-SiO₂ · Al₂O₃, catalytic activity and properties, **75**, 56
styrene formation mechanism, **75**, 66
- Ethylene
hydrogenation on
alumina-supported Pt at low temperature, *ir* study, **75**, 267
H_xMoO₃, H₂ reversal spillover, **73**, 309
Rh, effect of carbonaceous residues on catalytic activity, **78**, 44
TaC, **73**, 128
methanol conversion over ZSM-5 zeolite in presence of deuterated water, **75**, 284
oxidation on Pt
comment on model for isothermal oscillations, **73**, 198
response to comment, **73**, 201
reaction with photo-formed O⁻ hole centers on supported MoO₃, **75**, 204
synthesis via oxidative methane coupling, determination of active catalysts, **73**, 9
vapor-phase direct hydration over zirconium tungstate, catalytic behavior and kinetics at atmospheric pressure, **77**, 23
at high pressures, **77**, 554
vapor-phase epoxidation
on Ag, **77**, 499
Ag-Au, **77**, 499
- Ethylene glycol acetate esters
preparation from synthesis gas over Ru catalyst, **76**, 101
- Europium oxides
luminescence studies, thermal and hydration effects on metal ion symmetry, **77**, 94
- F
- Ferromagnetic resonance
Ni/graphite-hydrogen system, **75**, 175
- Fischer-Tropsch synthesis
and methanation on potassium-promoted silica-supported Ru catalysts, **77**, 338

- product distribution
 - effect of readsorption and growth of primary α -olefins, 77, 141
 - formation on iron catalyst in slurry reactor, carbon number distribution, 73, 187
 - over reduced iron catalysts, role of carbon and oxygen in activation of, 78, 24
 - Formaldehyde
 - condensation with acetophenone over cation-exchange resins, hydration rate effect, 77, 16
 - condensation with propiophenone over cation-exchange resins, hydration rate effect, 77, 16
 - interaction with glyoxal and $H_2 + CO$ on Rh/Al_2O_3 , 74, 97
 - reactions on iron surfaces, thermodynamics of surface reactions, 74, 55, 67
 - selective methanol oxidation over molybdate catalysts, kinetic isotope effect, 76, 238
 - Formic acid
 - dehydration on TiO_2
 - adsorption on electron-donor centers
 - NMR study, 74, 89
 - ab initio SCF study, 74, 84
 - nature of active centers, 74, 77
 - reactions on iron surfaces, thermodynamics of surface reactions, 74, 67
 - Fouling
 - Pt-Re reforming catalyst in model reforming reactions, 76, 265
 - Fourier transform infrared spectroscopy
 - coke formation and nature of active sites of HY catalysts, 78, 34
- G
- Gasification
 - uncatalyzed and Pt-catalyzed, of carbon by water and carbon dioxide, 75, 337
 - Glyoxal
 - interaction with formaldehyde and $H_2 + CO$ on Rh/Al_2O_3 , 74, 97
 - Gold
 - Ag-Au
 - vapor-phase epoxidation of ethylene, 77, 499
 - vapor-phase epoxidation of propylene, 77, 499
 - Graphite
 - supported Ni, interaction with H_2 , 75, 382
 - supported Pt catalyst
 - butadiene reduction, 74, 323
 - butene reduction, 74, 323
 - supported Pt-Ni alloys, structure and selectivity, 75, 101
 - surfaces, relationship between particle motion on graphite surface and Tammann temperature, 78, 473
 - water vapor reaction at low temperatures, methane production, 75, 7
 - Group V111 transition metals
 - catalytic synthesis of hydrocarbons from H_2/CO mixtures, methanation kinetics, 78, 265, 266
 - cyclohexanol catalytic transformations, 74, 31
 - toluene steam dealkylation, role of support, 75, 151
- H
- n*-Heptane
 - cracking, isomerization, and disproportionation on Cr-exchanged zeolite, kinetics, 77, 159
 - reforming at different pressures over Pt and Pt-Ir catalysts, comparison, 77, 104
 - Heterogeneous catalysts
 - deactivation kinetics, direct determination, reactor design, 73, 366
 - ir spectra of propene complexes of atomic metals, 74, 9
 - propene isomerization by atomic Ni and Pd, 74, 18
 - n*-Hexane
 - hydroisomerization on Pt zeolite
 - comparison with reaction mechanism on Pt/mordenite, 78, 275
 - kinetics, effect of Pt content, 78, 267
 - 1-Hexene
 - adsorption and reaction on HY cracking catalysts, hydrogen effect, 78, 247
 - conversion to di-2-hexyl ether using Cu^{2+} -smectite catalyst, 75, 190
 - cyclization, isomerization, and cracking on
 - aluminas, 77, 257
 - silica-aluminas, 77, 257
 - hydrogenation over molybdena catalysts, oxygen chemisorption, 77, 432
 - High-temperature treatment
 - Pt/ Al_2O_3 activity modification for *n*-pentane reactions, 73, 20
 - HY cracking catalysts
 - adsorption and reaction of 1-hexene, hydrogen effect, 78, 247
 - Hydration
 - vapor-phase, ethylene over zirconium tungstate, catalytic behavior and kinetics at
 - atmospheric pressure, 77, 23
 - high pressures, 77, 554
 - Hydrocarbons
 - activity and selectivity of bifunctional platinum catalysts in hydrocarbon reactions, 73, 30
 - carbon monoxide, and oxygenates, relative hydrogenation rates, 77, 558
 - liquid-phase oxidation, reaction rate pulsation, 78, 465
 - saturated, conversion over Pt-Pd/ SiO_2 , hydrogen effect, 77, 539
 - Hydrocracking
 - phenol, *o*-cresol, anisole, and guaiacol on Mo- Al_2O_3 , 77, 242

Hydrocyanation

dienes and trienes over nickel(0)-phosphite complexes, **78**, 209

Hydrodechlorination

and oligomerization of CCl_4 over Ni Y zeolites, **74**, 136

Hydrodenitrogenation

2,6-lupetidine on $\text{MoO}_3/\text{Al}_2\text{O}_3$ under H_2 pressure, **76**, 285

2,6-lutidine on $\text{MoO}_3/\text{Al}_2\text{O}_3$ under H_2 pressure, **76**, 285

Hydrodesulfurization

benzothiophene, bifunctional character of hydrotreating catalysts, **73**, 406

effect of triethylaluminum treatment on

CoS activity, **77**, 132

MoS activity, **77**, 132

NiS activity, **77**, 132

Mo/ Al_2O_3 surface properties, **76**, 300

nature of iron sulfides, **262**, 264

reducibility and activity of HDS catalysts, **76**, 241

thiophene over molybdena catalysts, oxygen chemisorption, **77**, 432

Hydroformylation

olefins over rhodium-zeolite catalyst, **75**, 188

Hydrogen

absorption of Mg_2Ni on complexation with large aromatic molecules, **77**, 279

absorption of SmMg_3 on complexation with large aromatic molecules, **77**, 279

adsorption-desorption from supported Ni catalysts, kinetics, **73**, 272

adsorption on silica-supported Pt metals, proton resonance, **77**, 53

and carbon monoxide chemisorption on

Ir/ $\gamma\text{-Al}_2\text{O}_3$, stoichiometry, **78**, 319

Y-zeolite-supported ruthenium catalyst, **78**, 182

chemisorption on ZnO, temperature-programmed desorption and infrared spectroscopy, **73**, 396

/CO catalytic methanol synthesis

CO_2 effects, **74**, 343

on Fe_2O_3 , changes in catalyst surface structure and composition, **75**, 39

over Ni catalyst, methanation, deuteromethane tracing, **75**, 314

Pd/ Al_2O_3 , ir spectroscopy, **74**, 44

Rh/ Al_2O_3 , **74**, 97

effect on adsorption and reaction of 1-hexene over HY cracking catalysts, **78**, 247

interaction with graphite-supported Ni, **75**, 382

neopentane reaction, surface interaction in Pt/ $\gamma\text{-Al}_2\text{O}_3$, **73**, 76

oxidation on Ni foil, effect of surface protrusions on self-sustained thermal oscillations, **73**, 294

photocatalyzed production from water by visible light, Mg- and Si-doped iron oxides, **78**, 341

pressure

2,6-lupetidine hydrodenitrogenation on $\text{MoO}_3/\text{Al}_2\text{O}_3$, **76**, 285

2,6-lutidine hydrodenitrogenation on $\text{MoO}_3/\text{Al}_2\text{O}_3$, **76**, 285

reactions of carbon monoxide over molybdenum charcoal catalysts, **78**, 116

role in water-surface carbon interaction to form methane, **77**, 297

species in reduced copper-chromium oxide catalysts, ^1H -NMR study, **76**, 231

spillover effects in benzene hydrogenation over Pt/ $\gamma\text{-Al}_2\text{O}_3$, **75**, 140

transfer reaction between ethanol and acetone over magnesium oxide, **73**, 120

Hydrogenation

aromatic compounds catalyzed by sulfided $\text{CoO-MoO}_3/\gamma\text{-Al}_2\text{O}_3$, **73**, 45

benzene over Ni catalysts, structure sensitivity and copper alloying effects, **75**, 233

benzene over Pt/ $\gamma\text{-Al}_2\text{O}_3$, hydrogen spillover effects, **75**, 140

1,3-butadiene, surface state, catalytic activity, and selectivity of Ni catalysts, electronic effects, **74**, 173

C_2H_4 , effect of carbonaceous residues on catalytic activity of Rh, **78**, 44

CO over

carbon-supported iron catalysts, **75**, 416

kinetic studies on polycrystalline Ni foils, **77**, 1

LaRhO_3 , formation of oxygen-containing organic molecules, **74**, 282

Rh-supported catalyst, **75**, 78; **76**, 1

Ru using transient response techniques, **73**, 257

Ru/ Al_2O_3 , effects of dispersion on catalytic activity and selectivity, **75**, 251

Ru/ SiO_2 , detection of surface species by reaction scavenging, **78**, 165

side effects in Fischer-Tropsch synthesis, **77**, 141

titania-supported catalysts, **74**, 199

 CO_2

methanation, surface state, catalytic activity, and selectivity of Ni catalysts, electronic effects, **74**, 183

on Ni/ SiO_2 , kinetics and mechanism, **77**, 460

Rh catalysts on various metal oxides, **76**, 1

conjugated dienes over La_2O_3 , mechanistic study, **76**, 65

effect of triethylaluminum treatment on

CoS activity, **77**, 132

MoS activity, **77**, 132

NiS activity, **77**, 132

enantioselective, methylacetoacetate on tartaric acid-modified Ni catalysts, effect of preparation variables, **74**, 382

ethylene by

H_2MoO_3 , **73**, 309

Pt/ Al_2O_3 , ir study, **75**, 267

- TaC, mechanism, **73**, 128
 hexene over molybdena catalysts, oxygen chemisorption, **77**, 432
 methyl-acetoacetate with supported Ni catalysts, pore diffusion effect, **76**, 316
 olefins over
 $\text{CrO}_x/\text{SiO}_2$, **77**, 360
 Pt on ZSM-5 as shape-selective support, **77**, 301
 phenylacetylene on supported Pd, effect of dispersion on selectivity and kinetics, **76**, 405
 preadsorbed N_2 , NH_3 synthesis on osmium powder, **74**, 110
 propene over Co-Ni sulfide catalysts, **76**, 164
 rates for carbon monoxide, hydrocarbons, and oxygenates, **77**, 558
 selective, 1,3-diolefin catalysis by Co-bipyridyl complexes, **73**, 228
 Hydrogen chloride
 $\text{CrO}_3/\text{silica}/\text{HCl}$, Cr(VI) state, **76**, 29
 Hydrogenolysis
 n-butane over Ir/TiO₂, metal-support interactions, **78**, 406
 ethane on Pt-Fe/SiO₂, kinetics and mechanism, **74**, 207
 ethane on Pt/SiO₂, kinetics and mechanism, **74**, 207
 methylcyclopentane over Pt single crystals and Pt-Al₂O₃, **77**, 323
 neopentane over Ir/TiO₂, metal-support interactions, **78**, 406
 selectivity equations, **78**, 419
 Hydrogen-oxygen
 interaction over Pt(111) surface, kinetics, **77**, 263
 Hydrogen sulfide
 dithiomolybdate stability, ESR study, **76**, 473
 dithiotungstate stability, ESR study, **76**, 473
 presulfurization, role in catalytic reforming and hydrogenolysis, **78**, 352
 Ru/Al₂O₃ poisoning in CO hydrogenation, **74**, 332
 Hydrogen transfer
 nitrobenzene reduction, preparation and catalytic activity of Pd/AlPO₄, Pd/AlPO₄-SiO₂, and Pd/AlPO₄- γ -Al₂O₃, **78**, 188
 Hydroisomerization
 n-hexane on Pt zeolites
 comparison between reaction mechanisms on Pt/Y-zeolites and on Pt/mordenite, **78**, 275
 kinetics, effect of Pt content, **78**, 267
 Hydrolysis
 chlorobenzene over Cu-promoted hydroxyapatites, **77**, 64
 Hydrotreating catalysts
 bifunctional character, in benzothiophene hydrodesulfurization, **73**, 406
 Hydrosilylation
 photoactivated homogeneous catalytic, carbonyl compounds, **78**, 111
 Hydroxyapatites
 Cu-promoted, chlorobenzene hydrolysis, **77**, 64
 HZSM-5
 mechanism of methanol conversion to hydrocarbons, **78**, 136
 I
 Infrared spectroscopy
 CO adsorption, geometric and ligand effects, **73**, 50
 CO hydrogenation on Pd/Al₂O₃, **74**, 44
 flow reactor
 benzoic acid reduction on Y₂O₃, **76**, 274
 methyl benzoate reduction on Y₂O₃, **76**, 274
 H₂ chemisorption on ZnO, temperature-programmed desorption, **73**, 396
 hydroxyl group acid strength of mixed SiO₂/MgO, SiO₂/Al₂O₃, and Al₂O₃/MgO, **77**, 141
 nitric oxide/Fe-Y zeolite interaction, **76**, 112
 propene complexes of atomic metals, **74**, 9
 Iridium
 alumina-supported, preparation from Ir₄(CO)₁₂, characterization, **75**, 23
 silica-supported, characterization, **75**, 23
 -TiO₂-supported, metal-support interaction in hydrogenation, dehydrogenation, and hydrogenolysis, **75**, 243; **78**, 406
 Iron
 on γ -Al₂O₃, stoichiometry of hydrogen and CO chemisorption, **78**, 319
 carbon-supported
 CO hydrogenation, **75**, 416
 in Fischer-Tropsch synthesis, chemisorption, magnetization, and Mössbauer spectroscopy, **76**, 208
 Y-zeolite-supported, and FeM, comparison of CO oxidation with NO, O₂, and N₂O, **78**, 327
 Fe(100)
 acetaldehyde reactions, **74**, 55
 acetone reactions, **74**, 55
 formaldehyde reactions, **74**, 55
 methanol, formaldehyde, and formic acid reactions and reaction intermediates, thermodynamics of surface reactions, **74**, 67
 Fischer-Tropsch synthesis in slurry reactor, carbon number distribution of products, **73**, 187
 MgO-supported, CO adsorption, infrared spectroscopy, **77**, 550
 manganese oxide-supported, role of carbon and oxygen in activation at low pressures, **78**, 24
 promoted catalyst, surface composition by auger electron spectroscopy, **77**, 208
 single crystals, effect of surface structure on catalyst activity in ammonia synthesis, **74**, 129
 surface state, effect on filamentous carbon formation, **77**, 74
 Iron molybdate
 Fe₂O₃-MoO₃/Al₂O₃
 effect of support, in methanol oxidation in fluidized bed reactors, **75**, 207

- Mössbauer and Auger spectroscopic studies, **78**, 454
- Iron oxides
- Mg-doped, photocatalyzed production of hydrogen from water by visible light, **78**, 341
 - oxygen
 - adsorption, kinetic evidence of atomic species, **75**, 329
 - effect on selective oxidation of butene, **77**, 410
 - Si-doped, photocatalyzed production of hydrogen from water by visible light, **78**, 341
 - surface structure and composition, changes during CO/H₂ reaction, **75**, 39
- Iron sulfides
- behavior during hydrodesulfurization, **78**, 262, 264
- Isomerization
- allyl alcohol, mechanism in Raney Ni presence, **75**, 1
 - butenes
 - over aluminum phosphate catalyst, **76**, 235
 - over MoS₂ single crystal catalysts, molecular mechanisms, regulation by conformation of active sites, **78**, 155
 - over reduced Mo/Al₂O₃, **76**, 48
 - 1-butene adsorbed on
 - mixed tin–antimony oxide, ¹³C-NMR study, **73**, 1
 - supported Pd, Ni, and Pd–Ni alloys, comparison, **76**, 169
 - dimethylbenzenes over stoichiometric metal phosphates (Al, Cr, Fe, Co, Ni, and Bi), comparison, **76**, 182
 - ¹³C-labeled hexanes over Pt single crystals and Pt–Al₂O₃, **77**, 323
 - 2-methylcyclohexanol and 1-methoxy-2-methylcyclohexane catalytic conversion, comparison, **74**, 24
 - olefins on triosmium clusters bonded to phosphine-functionalized supports, **73**, 82
 - propene by atomic Ni and Pd, **74**, 18
 - xylene over LaY zeolite catalyst, disproportionation, **75**, 291
- Isopentane
- dehydrogenation over silica–alumina cracking catalysts, **75**, 410
- Isoprene
- hydrogenation over La₂O₃, mechanistic study, **76**, 65
- Isotope effect
- kinetic, selective methanol oxidation to formaldehyde over molybdate catalysts, **76**, 238

K

- Kinetics
- deactivation, direct determination for heterogeneous catalyst, reactor design, **73**, 366
 - H₂ adsorption–desorption from supported Ni catalysts, **73**, 272

L

- Lactonization
- cyclo-octene-5-carboxylic acid, thermal decomposition of cyclohexyl esters, and propenylbenzene dimerization at clay surfaces, **78**, 197
- Lanthanate
- Co–La₂O₃–Pt in active C oxidation, enhancement of oxygen transmission, **76**, 84
- Lanthanum strontium manganite
- Mn³⁺ activity for N₂O decomposition, **75**, 185
 - Mn⁴⁺ activity for N₂O decomposition, **75**, 185
- Lanthanum
- LaY zeolite catalyst, xylene isomerization and disproportionation, **75**, 291
- Lanthanum oxide
- hydrogenation of conjugated dienes, mechanistic study, **76**, 65
- Lanthanum rhodate
- CO hydrogenation, formation of oxygen-containing organic molecules, **74**, 282
- Lewis acid
- centers, concentration in
 - silica–boria, **77**, 511
 - silica–germania, **77**, 514
- Light
- visible, Mg- and Si-doped iron oxides for photocatalyzed production of hydrogen from water, **78**, 341
- Luminescence
- Eu₂O₃, thermal and hydration effects on metal ion site symmetry, **77**, 94
- 2,6-Lupetidine
- hydrodenitrogenation on MoO₃/Al₂O₃ under H₂ pressure, **76**, 285
- 2,6-Lutidine
- hydrodenitrogenation on MoO₃/Al₂O₃ under H₂ pressure, **76**, 285

M

- Magnesia
- supported Ru in ammonia decomposition, formation of infrared-active nitrogen species, **78**, 147
- Magnesium
- atomic, butene isomerization, **75**, 425
 - doped iron oxides for photocatalyzed production of hydrogen from water by visible light, **78**, 341
- Metal oxides
- φ-classification for heterogeneous oxidation catalysts, **78**, 281
- Mg₂Ni
- improved hydrogen absorption on complexation with large aromatic molecules, **77**, 279
- Magnesium oxide
- hydrogen transfer reaction between ethanol and acetone, **73**, 120

- supported Fe, CO adsorption, ir spectroscopy, **77**, 550
- supported nickel, production by metal vapor methods, surface area and particle size effects, **73**, 216
- Magnetite**
 - silica-supported, oxide-oxide interactions, in water-gas shift, **76**, 93
- Magnium oxide**
 - supported Rh
 - CO hydrogenation, **76**, 1
 - CO₂ hydrogenation, **76**, 1
- Manganese**
 - Mo-V-W-Mn oxide acrolein oxidation catalyst, deactivation characteristics
 - kinetics of activity loss, **76**, 385
 - kinetics of crystallization, **76**, 393
- Manganese oxide**
 - mercury removal from waste gases, **73**, 337
- Mercury**
 - removal from waste gases by manganese oxide acceptors, **73**, 337
- Methacrolein**
 - oxidation to methacrylic acid over 12-molybdophosphoric acid, **77**, 169
- Methacrylic acid**
 - methacrolein oxidation over 12-molybdophosphoric acid, **77**, 169
- Methanation**
 - CO/H₂ over
 - Ni catalyst, deuteromethane tracing, **75**, 314
 - Ru/Al₂O₃, kinetic behavior and H₂S tolerance, **74**, 332
 - and Fischer-Tropsch studies on potassium-promoted silica-supported Ru catalysts, **77**, 338
 - kinetics, catalytic synthesis of hydrocarbons from H₂/CO mixtures over group VIII metals, **78**, 265, 266
 - Pt-Rb/SiO₂ clusters, **74**, 216
 - surface state, catalytic activity, and selectivity of Ni catalysts, electronic effects
 - CO, **74**, 183
 - CO₂, **74**, 183
- Methane**
 - oxidative coupling, ethylene synthesis, determination of active catalysts, **73**, 9
 - production from graphite/water vapor reaction at low temperatures, **75**, 7
 - synthesis over supported Pd catalyst, **73**, 237
- Methanol**
 - catalytic synthesis from CO/H₂, CO₂ effects, **74**, 343
 - conversion to ethylene over ZSM-5 zeolite in presence of deuterated water, **75**, 284
 - conversion to hydrocarbons over HZSM-5, mechanism, **78**, 136
 - properties of heteropoly acids, **77**, 473
 - dehydration over sulfonated poly(styrene-divinylbenzene), effect of physical properties on kinetics, **74**, 373
- hydrocarbon formation over zeolite catalysts, carbene intermediacy, **74**, 203
- oxidation, catalytic properties and activity of rare-earth orthoferrites, **74**, 317
- reactions on iron surfaces, thermodynamics of surface reactions, **74**, 67
- selective oxidation to formaldehyde over molybdate catalysts, kinetic isotope effect, **76**, 238
- synthesis over supported Pd catalyst, **73**, 237
- toluene alkylation on zeolite catalysts, selectivity for xylene isomers, **75**, 196
- vapor-phase oxidation to methyl formate over SnO₂-MoO₃, **77**, 279
- 1-Methoxy-2-methylcyclohexane
 - and 2-methylcyclohexanol, catalytic conversion, comparison, **74**, 24
- Methyl acetoacetate**
 - enantioselective hydrogenation to methyl 3-hydroxybutyrate on tartaric acid-modified Ni catalysts, effect of preparation variables, **74**, 382
 - hydrogenation on Ni-supported catalysts, pore diffusion effect, **76**, 316
- Methyl benzoate**
 - reduction on Y₂O₃ in infrared spectroscopic flow reactor, **76**, 274
- Methyl cyclohexane**
 - dehydrogenation, fouling of Pt reforming catalyst, **73**, 377
- 2-Methylcyclohexanol
 - and 1-methoxy-2-methylcyclohexane, catalytic conversion, comparison, **74**, 24
- Methylcyclopentane**
 - and cyclohexane isomerization-dehydrogenation over Pt and Ir catalysts, **74**, 156
 - isomerization and hydrogenolysis on Pt-Al₂O₃ and Pt single crystal faces, **77**, 323
- Methyl formate**
 - methanol vapor-phase oxidation over SnO₂-MoO₃, **77**, 279
- Methyl 3-hydroxybutyrate**
 - enantioselective hydrogenation of methyl acetoacetate over tartaric acid-modified Ni catalysts, effect of preparation variables, **74**, 382
- Model**
 - for catalyst with skewed unimodal acid strength distribution, **76**, 294
 - contact synergy, promoting effect in unsupported Co-Mo hydrosulfurization catalysts, **77**, 564
- Molybdates**
 - Fe₂(MoO₄)₃
 - Bi-doped, propylene oxidation to acrolein, **76**, 188
 - Te-doped, propylene oxidation to acrolein, **76**, 188
 - selective methanol oxidation to formaldehyde, kinetic isotope effect, **76**, 238

Molybdena-alumina catalyst

- n*-butene isomerization, **76**, 48
- effect of Fe atoms on coal hydrogenations, metal-support interactions, Mössbauer and Auger spectroscopy, **78**, 454
- hydrocracking of phenol, *o*-cresol, anisole, and guaiacol, **77**, 242
- NO adsorption, infrared and volumetric study, **75**, 354
- preparation and genesis, **77**, 232
- pyridine adsorption, **76**, 133
- site-selective chemisorption, **77**, 221
- surface properties in hydrodesulfurization, **76**, 300

Molybdenum

- /charcoal, reactions of carbon monoxide with hydrogen, **78**, 116

- Mo-V-W-Mn oxide acrolein oxidation catalyst, deactivation characteristics
- kinetics of activity, **76**, 385
- kinetics of crystallization, **76**, 393

- oxygen chemisorption on sulfided catalysts for thiophene hydrodesulfurization and hexene hydrogenation, **77**, 432

Molybdenum oxide

- γ -alumina-supported
- characterization, reducibility of oxidic state versus hydrodesulfurization activity of sulfided state, **76**, 241
- 2,6-lupetidine hydrodenitrogenation under H₂ pressure, **76**, 285
- 2,6-lutidine hydrodenitrogenation under H₂ pressure, **76**, 285
- supported, C₂H₄ reaction with photo-formed O-hole centers, **75**, 204

Molybdenum sulfide

- acid site density measurement, **78**, 469
- hydrogenation and hydrodesulfurization activity, effect of treatment with triethylaluminum, **77**, 132
- molecular mechanism of catalytic isomerization and hydrogen exchange of olefins, regulation by conformation of active sites, **78**, 155
- relation between defects and hydrodesulfurization activity, electron spin resonance, **78**, 380

12-Molybdophosphoric acid

- methacrolein oxidation to methacrylic acid, **77**, 169
- properties and conversion of methanol to hydrocarbons, **77**, 473

Mordenite

- supported Pt, *n*-hexane hydroisomerization, comparison with reaction mechanisms on Pt/Y-zeolites, **78**, 275

Mössbauer spectroscopy

- nitric oxide/Fe-Y zeolite interaction, **76**, 112
- tin-antimony oxide catalysts, formation and surface composition, **73**, 349
- and X-ray photoelectron spectroscopy of Co state in sulfided, supported, and unsupported Co-Mo catalysts, **77**, 397

N**NaY**

- RhNaY, CO/H₂O interaction, **75**, 302

Neopentane

- hydrogenolysis over
- Ir/TiO₂, metal-support interactions, **78**, 406
- Pt/ γ -Al₂O₃, surface interaction, **73**, 76
- isomerization, with hydrogen and deuterium on epitaxially oriented (111)Pd and Pd-Au alloy films, **77**, 118

Neutron inelastic spectroscopy

- benzene-Ni interaction, **74**, 296

Nickel**alumina-supported catalyst**

- morphology, **76**, 157
- paracrystallinity, **78**, 257
- on γ -Al₂O₃, metal-support interactions, photoacoustic spectroscopy, **78**, 360

atomic

- butene isomerization, **75**, 425
- propene isomerization and structure, **74**, 18
- benzene interaction, neutron inelastic spectroscopy, **74**, 296

Co-Ni sulfide catalysts in propene hydrogenation, 76, 164

- faujasites, characterization of dispersions by transmission electron microscopy, **74**, 188

foils

- hydrogenation of CO to methane, kinetics, **77**, 1
- hydrogen oxidation, effect of surface protrusions on self-sustained thermal oscillations, **73**, 294

- grafol system, ferromagnetic resonance, **75**, 175
- on graphite, interaction with H₂, **75**, 382

- /MgO, production by metal vapor methods, surface area and particle size effects, **73**, 216

- /mica, small supported, UHV studies of CO interaction, **73**, 91

- modified with tartaric acid, effect of preparation variables on enantioselectivity, **74**, 382

- Ni(CO)₄ formation on Ni(100), promotion and inhibition, kinetics and ESCA measurements, **77**, 382

- Pd, and Pd-Ni silica-supported, but-1-ene isomerization, **76**, 169

- Pt-Ni graphite-supported alloys, structure and selectivity, **75**, 101

- Raney, racemization and reduction of optically active 1,1'-binaphthyl, **74**, 275

- silica-alumina-supported, differential cation exchange capacity, **78**, 88

silica-supported

- copper alloying effects during benzene hydrogenation, **75**, 233

- pore diffusion effect in methyl-acetoacetate hydrogenation, **76**, 316

- supported catalyst
 - CO hydrogenation, sulfur deactivation, **76**, 369
 - H₂ adsorption-desorption kinetics, **73**, 272
 - on titania, strong metal-support interaction, interfacial effects, **78**, 389
 - surface electronic properties and hydrogenation activity, **73**, 136
 - unsupported catalysts, surface state, catalytic activity, and selectivity in 1,3-butadiene hydrogenation, electronic effects, **74**, 173, 183
 - use of organic probes in detecting active sites, **78**, 1
 - Y zeolites
 - CCl₄, hydrodechlorination and oligomerization, **74**, 136
 - CO catalytic oxidation, **77**, 561
 - Ni(100)
 - promotion and inhibition of Ni(CO)₄ formation, kinetics and ESCA measurements, **77**, 382
 - Ni-Mo hydrodesulfurization catalysts
 - unsupported, characterization by oxygen chemisorption, **78**, 253
 - Nickel-(0)-phosphite complexes
 - diene and triene catalytic hydrocyanation, **78**, 209
 - Nickel sulfide
 - hydrogenation and hydrodesulfurization activity, effect of treatment with triethylaluminum, **77**, 132
 - Nitric oxide
 - CO oxidation over FeY, comparison with FeM, kinetics and mechanism, **78**, 327
 - interaction with Fe-Y zeolite, infrared and Mössbauer spectroscopy, **76**, 112
 - reduction over cobalt tetraphenylporphyrin supported on TiO₂, kinetics, **77**, 519
 - Nitrobenzene
 - reduction by hydrogen transfer, preparation of Pd/AlPO₄, Pd/AlPO₄-SiO₂, and Pd/AlPO₄- γ -Al₂O₃, comparison of catalytic activity, **78**, 188
 - Nitrogen
 - preadsorbed, hydrogenation, NH₃ synthesis on osmium powder, **74**, 110
 - Nitrogen monoxide
 - adlayers on Pt, interpretation in terms of vibrational-coupling model, **78**, 225
 - adsorption on alumina-supported hydrodesulfurization catalysts, infrared and volumetric study, **75**, 354
 - chemisorption as probe of active precursors in Co-Mo/Al₂O₃, **77**, 293
 - Nitrogen oxide
 - reaction with NH₃ on V₂O₅, kinetics by pulse technique, **74**, 144
 - Nitrous oxide
 - CO oxidation over FeY, comparison with FeM, kinetics and mechanism, **78**, 327
 - decomposition
 - Mn³⁺ activity in lanthanum strontium manganite, **75**, 185
 - Mn⁴⁺ in lanthanum strontium manganite, **75**, 185
 - Ni²⁺, Co²⁺, and Cr³⁺ in solid solutions, electronic structure and catalytic activity, **74**, 1
 - Nuclear magnetic resonance spectroscopy
 - ¹³C, 1-butene adsorption and isomerization on tin-antimony oxide, **73**, 1
 - ¹H, hydrogen species in reduced copper-chromium oxide catalysts, **76**, 231
- O
- Olefins
 - (ethylene, propylene, butenes, and pentenes), vapor-phase catalytic oxidation over Ag, kinetic and adsorption studies, **76**, 333
 - hydroformylation over rhodium zeolite catalyst, **75**, 188
 - isomerization on triosmium clusters bonded to phosphine-functionalized supports, **73**, 82
 - Oligomerization
 - and hydrodechlorination of CCl₄ over Ni Y zeolites, **74**, 136
 - Orthoferrites
 - rare-earth, catalytic properties and activity in methanol oxidation, **74**, 317
 - Oscillations
 - isothermal
 - comment on model during ethylene oxidation on Pt, **73**, 198
 - response to comment, **73**, 201
 - propylene oxide oxidation on polycrystalline silver, **74**, 266
 - self-sustained thermal, effect of surface protrusions during hydrogen oxidation on Ni foil, **73**, 294
 - Osmium
 - powder, ammonia synthesis and hydrogenation of preadsorbed N₂ from 100 to 500°C, **74**, 110
 - Oxidation
 - active C over Co-La₂O₃-Pt, enhancement of oxygen transmission, **76**, 84
 - and ammoxidation of allyl amine over bismuth molybdates, **75**, 225
 - catalytic, CO on Ni-Y, **77**, 561
 - CO
 - catalytic contribution of lattice oxygen atoms of praseodymium oxide, **76**, 61
 - on supported Pt catalysts
 - effect of metal dispersion, **74**, 408, 411
 - infrared study, **75**, 275
 - H₂ on Ni foil, effect of surface protrusions on self-sustained thermal oscillations, **73**, 294
 - hydrocarbons over Pt on ZSM-5 as shape-selective support, **77**, 301
 - methanol to formaldehyde over molybdate catalysts, kinetic isotope effect, **76**, 238
 - methanol over rare-earth orthoferrites, catalytic properties and activities, **74**, 317
 - propylene to acrolein on Fe₂(MoO₄)₃ doped with Bi, **76**, 188

- Te, **76**, 188
- selective, propene over molybdenum–tungsten oxide catalysts, effect of crystallographic shear planes, **77**, 169
- vapor-phase
- methanol to methyl formate over $\text{SnO}_2\text{--MoO}_3$, **77**, 279
 - olefins over Ag, kinetic and adsorption studies, **76**, 333
 - tetrahydrofuran to γ -butyrolactone over $\text{V}_2\text{O}_5\text{--SiO}_2$ catalyst, kinetics and XRD, **77**, 192
 - o*-xylene over $\text{V}_2\text{O}_5\text{--TiO}_2$, **77**, 309
- Oxidation catalysts
- heterogeneous, ϕ -classification of metal oxides, **78**, 281
- Oxygen
- adsorption on $\alpha\text{-Fe}_2\text{O}_3$, kinetic evidence of atomic species, **75**, 329
 - chemisorption, characterization of unsupported Ni–Mo hydrodesulfurization catalysts, **78**, 253
 - CO oxidation over FeY, comparison with FeM, kinetics and mechanism, **78**, 327
 - enhancement of transmission in active C oxidation by Co– $\text{La}_2\text{O}_3\text{--Pt}$, **76**, 84
 - interaction with Ni overlayers deposited on Cu, XPS study, **77**, 200
 - on iron oxide, effect on selective oxidation of butene, **77**, 410
 - lattice atoms of terbium oxide, thermal behavior and catalytic reactivity, **77**, 485
 - role in activation of iron Fischer–Tropsch catalyst at low pressures, **78**, 24
 - V–Ti–O catalysts, activities in 3-picoline ammoxidation, ir spectra, **76**, 144
- Oxygenates
- carbon monoxide, and hydrocarbons, relative hydrogenation rates, **77**, 558
- P
- Palladium
- on Al_2O_3 , CO hydrogenation, ir spectroscopy, **74**, 44
 - on AlPO_4 , $\text{AlPO}_4\text{--SiO}_2$, and $\text{AlPO}_4\text{--}\gamma\text{-Al}_2\text{O}_3$, preparation and comparison of catalytic activity for reduction of nitrobenzene by hydrogen transfer, **78**, 188
 - epitaxially oriented, neopentane isomerization with hydrogen and deuterium, **77**, 118
 - /mica, interaction with CO, UHV studies, **73**, 104
 - Ni, and -Ni silica-supported, but-1-ene isomerization, **76**, 169
 - particles on amorphous SiO_2 , treatment with H_2S , SO_2 , O_2 , and H_2 , x-ray photoelectron spectroscopy and transmission electron microscopy, **78**, 306
 - propene isomerization and structure, **74**, 18
 - / SiO_2 , effects of pretreatment on structure, **77**, 421
 - supported
 - methane synthesis, **73**, 237
 - methanol synthesis, **73**, 237
 - phenylacetylene hydrogenation, effect of dispersion on selectivity and kinetics, **76**, 405
- Pd–Au
- alloy films, neopentane isomerization with hydrogen and deuterium, **77**, 118
- Paracrystallinity
- coprecipitated nickel/alumina catalyst, **78**, 257
- Particles
- motion on graphite surface, relationship to Tamman temperature, **78**, 473
- n*-Pentane
- disproportionation catalyzed by aluminum chloride/sulfonic acid resin, **76**, 440
 - $\text{Pt/Al}_2\text{O}_3$ activity modification by high-temperature treatment, **73**, 20
- Phenylacetylene
- hydrogenation on supported Pd, effect of dispersion on selectivity and kinetics, **76**, 405
- Phosphates
- stoichiometric, (Al, Cr, Fe, Co, Ni, and Bi), dimethylbutene isomerization, comparison, **76**, 182
- Phosphine
- functionalized supports, bondage to triosmium clusters in olefin isomerization, **73**, 82
- Photoacoustic spectroscopy
- metal–support interactions in
 - Co/ $\gamma\text{-Al}_2\text{O}_3$, **78**, 360
 - Ni/ $\gamma\text{-Al}_2\text{O}_3$, **78**, 360
 - surface acidity of oxide catalysts, **75**, 262
- Photodesorption
- band gap radiation-induced from SrTiO_3 , **73**, 329
- 3-Picoline
- ammoxidation over V–Ti–O catalysts, ir spectra, **76**, 144
- Platinum
- alumina-supported
 - activity modification for *n*-pentane reactions by high-temperature treatment, **73**, 20
 - CO oxidation
 - effect of diluent gases, **77**, 527
 - rate and surface coverage, ir spectroscopy, **76**, 450
 - isothermal beds in CO oxidation, oscillatory behavior, **75**, 122
 - cyclohexane and methylcyclopentane isomerization–dehydrogenation, comparison with Ir catalyst, **74**, 156
 - ethylene hydrogenation, infrared study, **75**, 267
 - isomerization and hydrogenolysis of C_6 alkanes, **77**, 323
 - presulfurization, role in catalytic reforming and hydrogenolysis, **78**, 352

- γ -Al₂O₃-supported
 - surface interaction, neopentane hydrogenolysis, **73**, **76**
- catalyzed olefin hydrogenation on ZSM-5 zeolite as shape-selective support, **77**, **301**
- catalyzed and uncatalyzed carbon gasification by H₂O and CO₂, **75**, **337**
- clusters, poisoning and promoting effects of additives (Cu, Ag, Cl, and S), **73**, **171**
- Co-La₂O₃-Pt in active C oxidation, enhancement of oxygen transmission, **76**, **84**
- Cu/ γ -Al₂O₃, CO oxidation, X-ray photoelectron spectroscopy, **74**, **307**
- distribution in Pt-Re/Al₂O₃ naphtha reforming catalysts, **78**, **445**
- ethylene oxidation
 - comment on model for isothermal oscillations, **73**, **198**
 - response to comment, **73**, **201**
- graphite-supported
 - butadiene reduction, **74**, **323**
 - butene reduction, **74**, **323**
- group, hydrogen adsorption on silica gel, proton resonance, **77**, **53**
- infrared spectra of adlayers, interpretation in terms of vibrational-coupling model, **78**, **225**
- Ni-supported alloys, structure and selectivity, **75**, **101**
- particles on amorphous SiO₂, treatment with H₂S, SO₂, O₂, and H₂, x-ray photoelectron spectroscopy and transmission electron microscopy, **78**, **306**
- and Pt-Ir catalysts in heptane reforming, comparison, **77**, **104**
- reactivity and composition of strongly adsorbed carbonaceous deposits, model of working hydrocarbon conversion catalyst, **77**, **439**
- silica-supported
 - CO oxidation, infrared study, **75**, **275**
 - effect of pretreatment on structures, **78**, **289**
 - infrared spectroscopy of CO adsorbed on, **78**, **461**
 - single crystal faces, isomerization and hydrogenolysis of C₆ alkanes, **77**, **323**
- stabilized Y-zeolites, hydroisomerization of *n*-hexane
 - comparison with reaction mechanism on Pt/mordenite, **78**, **275**
 - kinetics, **78**, **267**
- supported
 - activity and selectivity in hydrocarbon reactions, **73**, **30**
 - adsorption effects during temperature-programmed CO desorption, **73**, **66**
 - in CO oxidation, effect of metal dispersion, **74**, **408**, **411**
 - simultaneous diffusion and adsorption of chloroplatinic acid in charcoal pellet during preparation, **77**, **248**
 - TiO₂-supported, metal-support interaction in hydrogenation, dehydrogenation, and hydrogenolysis, **75**, **243**; **76**, **225**
 - electrical conductivity, **78**, **425**
- Platinum(111)
 - adsorption and dehydrogenation of alcohols and ethers, **78**, **126**
 - surface, hydrogen-oxygen reaction, transient titration of adsorbed oxygen with hydrogen, **77**, **257**
- Platinum-Copper
 - γ -Al₂O₃-supported, activity and XPS studies of sulfur poisoning effect during CO oxidation, **75**, **396**
- Platinum-Iridium
 - on Al₂O₃, presulfurization, role in catalytic reforming and hydrogenolysis, **78**, **352**
 - heptane reforming, comparison, **77**, **104**
- Platinum-Palladium
 - /SiO₂, conversion of C₆ hydrocarbons, hydrogen effects, **77**, **539**
- Pt reforming catalyst
 - deactivation kinetics direct determination, reactor design, **73**, **366**
 - fouling during methyl cyclohexane dehydrogenation, **73**, **377**
- Platinum-Rhenium
 - on Al₂O₃, presulfurization, role in catalytic reforming and hydrogenolysis, **78**, **352**
 - fouling using model reforming reactions, **76**, **265**
 - /SiO₂ clusters, methanation, **74**, **216**
 - temperature-programmed reduction profile, effect of drying temperature, **77**, **43**
- Polymerization
 - ethene over Cr O_x/SiO₂, **77**, **360**
- Poly(styrene-divinylbenzene)
 - sulfonated
 - ethyl acetate reesterification with *n*-propanol, diffusion and effect of physical properties on reesterification rate, **74**, **361**
 - methanol dehydration, effect of physical properties on kinetics, **74**, **373**
- Pores
 - diffusion, effect in enantioselective hydrogenation with supported Ni catalysts **76**, **316**
- Potassium
 - promoted silica-supported Ru catalysts, methanation and Fischer-Tropsch studies, **77**, **338**
- Praseodymium oxide
 - lattice oxygen atoms, catalytic contribution to CO oxidation, **76**, **61**
- 2-Propanol
 - decomposition, calcium phosphate catalytic behavior, **75**, **200**
- Propene
 - complexes of atomic metals, ir spectra, **74**, **9**
 - hydrogenation over Co-Ni sulfide catalysts, **76**, **164**
 - isomerization by atomic Ni and Pd, **74**, **18**
 - selective oxidation, effect of crystallographic shear

- planes on behavior of molybdenum–tungsten oxide catalysts, **77**, 169
- Propenylbenzene
dimerization, thermal decomposition of cyclohexyl esters, and lactonization of cyclooctene-5-carboxylic acid at clay surfaces, **78**, 197
- Propanoic acid
adsorption on plasma-grown aluminum oxides, comparison with β -alanine, 1-propanol, 1-propylamine, and 3-amino-1-propanol, **78**, 96
- 1-Propanol
adsorption on plasma-grown aluminum oxides, comparison with propanoic acid and β -alanine, **78**, 96
- Propene
metathesis, and isomerization of 2-butene, active centers on WO_3/SiO_2 from various preparations, **78**, 17
- Propiophenone
condensation with formaldehyde over cation-exchange resins, hydration rate effect, **77**, 16
- 1-Propylamine
adsorption of plasma-grown aluminum oxides, comparison with propanoic acid and β -alanine, **78**, 96
- Propylene
ammonoxidation
catalyst optimal composition and reaction selectivity, **75**, 375
(Te–Ce)O structure and activity, **75**, 134
oxidation to acrolein on $\text{Fe}_2(\text{MoO}_4)_3$ doped with Bi, **76**, 188
Te, **76**, 188
vapor-phase epoxidation
on Ag, **77**, 499
on Ag–Au catalysts, **77**, 499
- Propylene oxide
oxidation on polycrystalline silver, kinetics and rate oscillations, **74**, 266
- Proton resonance
hydrogen adsorption on supported Pt metals, **77**, 53
- Protrusions
surface, effect on self-sustained thermal oscillations during H_2 oxidation on Ni foil, **73**, 294
- Pulsation
liquid-phase oxidation of hydrocarbons, reaction rate, **78**, 465
- Pulse technique
 NO/NH_3 reaction on V_2O_5 , kinetics, **74**, 144
- Pyridine
adsorption
concentration of Lewis acid centers, **77**, 511
on molybdena–alumina catalysts, **76**, 133
propylene ammonoxidation, catalyst optimal composition and reaction selectivity, **75**, 375
- Pyrite
nature of iron sulfides during catalytic reactions, **78**, 262
- Pyrrhotite
nature of iron sulfides during catalytic reactions, **78**, 262
- R
- Racemization
optically active 1,1'-binaphthyl by Raney Ni, **74**, 275
- Radiation
-induced photodesorption from SrTiO_3 (band gap), **73**, 329
- Raney Ni
allyl alcohol isomerization mechanism, **75**, 1
- Redox cycles
Cu-oxidation states on alumina, **76**, 320
- Reduction
temperature-programmed of $\text{Pt}/\text{Rh}/\text{Al}_2\text{O}_3$, effect of drying temperature, **77**, 43
- Reesterification
ethyl acetate with *n*-propanol over sulfonated poly(styrene–divinylbenzene) catalysts, diffusion and effect of physical properties, **74**, 361
- Reforming
heptane over Pt and Pt–Ir catalysts, comparison, **77**, 104
- Residues
carbonaceous, effect on catalytic activity of Rh in C_2H_4 hydrogenation, **78**, 44
- Resins
cation-exchange
formaldehyde condensation with acetophenone, hydration rate effect, **77**, 16
formaldehyde condensation with propiophenone, hydration rate effect, **77**, 16
- Rhenium
ammonia synthesis activity, effect of water and surface sulfur on activity, **78**, 142
 $\text{Pt-Re}/\text{Al}_2\text{O}_3$ naphtha reforming catalysts, distribution, **78**, 445
supported catalyst in ammonia synthesis as probe reaction, **77**, 57
- Rhenium/Platinum
supported catalyst for ammonia synthesis as probe reaction, **77**, 57
- Rhodium
 Al_2O_3 -supported, interaction of formaldehyde, glyoxal, and $\text{H}_2 + \text{CO}$, **74**, 97
catalytic activity in C_2H_4 hydrogenation, effect of carbonaceous residues, **78**, 44
olefin hydroformylation over zeolite catalyst, **75**, 188
particles on amorphous SiO_2 , treatment with H_2S , SO_2 , O_2 , and H_2 , x-ray photoelectron spectroscopy and transmission electron microscopy, **78**, 306
supported
CO hydration, **76**, 1

- CO₂ hydration, **76**, **1**
 CO hydrogenation, **75**, **78**, **302**
 -TiO₂-supported
 metal-support interaction in hydrogenation, dehydrogenation, and hydrogenolysis, **75**, **243**
 X-ray photoelectron spectroscopy, **77**, **85**, **301**
Rhodium-tellurium
 on charcoal, 1,3-butadiene liquid-phase diacetoxylation, **76**, **354**
Rubidium
 Pt-Rb/SiO₂ clusters, methanation, **74**, **216**
Ruthenium
 alumina-supported
 activity and selectivity in CO hydrogenation, effects of dispersion, **75**, **251**
 ammonia decomposition, formation of infrared-active nitrogen species, **78**, **147**
 CO hydrogenation
 kinetic behavior and H₂S tolerance, **74**, **332**
 using transient response techniques, **73**, **257**
 water-induced effects, **74**, **192**
 in Y-type zeolite, **74**, **393**
 in ethylene glycol acetate ester preparation from synthesis gas, **76**, **101**
 on MgO, ammonia decomposition, formation of infrared-active nitrogen species, **78**, **147**
 potassium-promoted silica-supported catalyst, methanation and Fischer-Tropsch studies, **77**, **338**
 Ru₃(CO)₁₂/Al₂O₃, surface characterization
 interaction with hydroxylated surface, **74**, **225**
 properties after full decarbonylation and reduction, **74**, **252**
 structure and reactivity of surface carbonylic complexes, **74**, **240**
 over SiO₂, detection of surface species by reaction scavenging, **78**, **165**
 Y-zeolite-supported, hydrogen and carbon monoxide adsorptions, reversible chemisorption, **78**, **182**
- S**
- Shape index analysis**
 temperature-programmed desorption from porous catalysts, **75**, **428**, **433**
Silica
 calcined, chromyl chloride vapor/hydroxyl population, Cr(VI) state, **76**, **17**
 CO hydrogenation on Pd, ir spectroscopy, **74**, **44**
 Cr(VI) state on Phillips polymerization catalyst, saturation coverage, **76**, **37**
 impregnation with thioheteroanions containing Ni or Co and Mo or W, correlation of ESR signal intensity with thiophene conversion, **76**, **466**
 formaldehyde, glyoxal, and H₂ + CO on Rh, **74**, **97**
 ketone ammoximation to oximes, **73**, **57**
 Ni, CO₂ hydrogenation, kinetics and mechanism, **77**, **460**
 -supported CrO_x
 hydrogenation and polymerization of olefins, **77**, **360**
 XPS study, **77**, **348**
 -supported Ir, preparation from Ir₄(CO)₁₂, characterization, **75**, **23**
 -supported magnetite, oxide-oxide interactions in water-gas shift, **76**, **93**
 -supported Ni
 copper alloying effects during benzene hydrogenation, **75**, **233**
 pore diffusion effect in methyl-acetoacetate hydrogenation, **76**, **316**
 -supported Pd, effects of pretreatment on structure, **77**, **421**
 -supported Pd, Ni, Pd-Ni
 but-1-ene isomerization, **76**, **169**
 -supported Pt
 CO adsorption, infrared spectroscopy, **78**, **461**
 CO oxidation
 effect of metal dispersion, **74**, **408**, **411**
 infrared study, **75**, **275**
 effects of pretreatment on structures, **78**, **289**
 ethane hydrogenolysis, kinetics and mechanism, **74**, **207**
 oscillatory behavior of isothermal beds in CO oxidation, **75**, **122**
 -supported Pt-Fe
 ethane hydrogenolysis, kinetics and mechanism, **74**, **207**
 -supported Pt-Pd, conversion of C₆ hydrocarbons, hydrogen effect, **77**, **539**
 -supported Pt-Rb clusters, **74**, **216**
 -supported Rh
 CO hydrogenation, **76**, **1**
 CO₂ hydrogenation, **76**, **1**
 CO/H₂O interaction, **75**, **302**
 -supported Ru
 CO hydrogenation
 detection of surface species by reaction scavenging, **78**, **165**
 kinetic behavior and poisoning, **74**, **332**
 methanation and Fischer-Tropsch studies, **77**, **338**
 -supported WO₃, active centers for metathesis and isomerization of alkenes, **78**, **17**
Silica-alumina
 hexene cyclization, isomerization, and cracking, **77**, **257**
 isopentane dehydrogenation, activity and product distribution, **75**, **410**
 nickel supported, differential cation exchange capacity, **78**, **88**
Silica-boria
 pyridine adsorption, concentration of Lewis acid centers, **77**, **511**

- Silica gel
OH groups, acetone adsorption, ^{13}C -NMR study, **75**, 219
-supported Pt metals, proton resonance of hydrogen adsorbed on, **77**, 53
-supported V_2O_5 , tetrahydrofuran vapor-phase oxidation to γ -butyrolactone, kinetics and XRD, **77**, 192
- Silica-germania
pyridine adsorption, concentration of Lewis acid centers, **77**, 511
- $\text{SiO}_2/\text{MgO}/\text{SiO}_2/\text{Al}_2\text{O}_3/\text{Al}_2\text{O}_3/\text{MgO}$
hydroxyl group acid strength, infrared spectroscopy, **77**, 141
- Silver
allyl alcohol-3- d_1 oxidative dehydrogenation, stereochemistry, **75**, 404
clusters, poisoning and promoting effects of additives, **73**, 171
effect on catalytic behavior of
Ag clusters, **73**, 171
Pt clusters, **73**, 171
ethylene vapor-phase epoxidation, **77**, 499
kinetic and adsorption studies on vapor-phase catalytic oxidation of olefins, **76**, 333
polycrystalline, propylene oxide oxidation, kinetics and rate oscillations, **74**, 266
propylene vapor-phase epoxidation, **77**, 499
 TiO_2 -supported, electron exchange, **76**, 254
- SmMg_3
improved hydrogen absorption on complexation with large aromatic molecules, **77**, 279
- $\text{SnO}_2\text{-MoO}_3$
methanol vapor-phase oxidation to methyl formate, **77**, 279
- Sodium
- $\text{SiO}_2 \cdot \text{Al}_2\text{O}_3$, catalytic activity and properties, oxidative dehydrogenation of ethylbenzene, **75**, 56
- Solid solutions
cation catalytic behavior, electrostatic potential approach, **73**, 387
- Steam
dealkylation, toluene over group VIII metal catalysts, role of support, **75**, 151
- Strontium titanate
band gap radiation-induced photodesorption, **73**, 329
- Styrene
formation by oxidative ethylbenzene dehydrogenation, **75**, 66
- Sulfur
deactivation of Ni methanation catalysts, **76**, 369
effect on catalytic behavior of
Ag clusters, **73**, 171
Pt clusters, **73**, 171
on noble metal catalyst particles, **78**, 306
poisoning effect on $\text{Pt-Cu}/\gamma\text{-Al}_2\text{O}_3$ oxidation catalysts, activity and XPS studies, **75**, 396
surface, effect on rhenium activity in ammonia synthesis, **78**, 142
- Surface areas
plutonium dioxide, determination from x-ray crystallite sizes, **78**, 477
- Surface properties
 $\text{Co}/\text{Al}_2\text{O}_3$, Zn effect, **74**, 121
 $\text{Mo}/\text{Al}_2\text{O}_3$ in hydrosulfurization, **76**, 300
- Surface structure
iron single crystals, effect on catalyst activity in ammonia synthesis, **74**, 129
- Synthesis gas
ethylene glycol acetate ester preparation over Ru catalyst, **76**, 101
formation of aromatics, role of carbon and oxygen in activation of iron Fischer-Tropsch catalyst at low pressures, **78**, 24
- T
- Tammann temperature
relationship between particle motion on graphite surface and, **78**, 473
- Tantalum monocarbide
ethylene hydrogenation mechanism and nature of active sites on, **73**, 128
- Tartaric acid
Ni catalyst modification, effect of preparation variables on enantioselectivity, **74**, 382
- Tellurium
Rh-Te on charcoal, 1,3-butadiene liquid-phase diacetoxylation, **76**, 354
- Tellurium-cerium oxide
structure and activity in propylene ammoxidation, **75**, 134
- Temperature-programmed desorption
from porous catalysts, shape index analysis, **75**, 428, 433
- Temperature-programmed reaction spectroscopy
adsorption and dehydrogenation of alcohols and ethers on $\text{Pt}(111)$, **78**, 126
aldehydes and ketones on $\text{Fe}(100)$, **74**, 55
- Temperature-programmed reduction
 $\text{Pt}/\text{Rh}/\text{Al}_2\text{O}_3$, effect of drying temperature, **77**, 43
- Terbium oxide
lattice oxygen atoms, thermal behavior and catalytic reactivity, **77**, 485
- Tetrahydrofuran
vapor-phase oxidation to γ -butyrolactone over $\text{V}_2\text{O}_5\text{-SiO}_2$ catalyst, kinetics and XRD, **77**, 192
- Tetra(neophyl)zirconium
uptake by alumina during synthesis, diffusion control, **77**, 491
- Thermal desorption spectroscopy
CO desorption from Ni sites on Ni-rich(110) Cu-Ni surface, work function as monitor, **73**, 288

Thioheteroanions

containing Ni or Co and Mo or W, silica impregnation, correlation of ESR signal intensity with thiophene conversion, **76**, 466

Thiophene

conversion, correlation with ESR signal intensity in alumina impregnation with thioheteroanions containing Ni or Co and Mo or W, **76**, 466
silica impregnation, **76**, 466
hydrodesulfurization over molybdena catalysts, oxygen chemisorption, **77**, 432

Tin-antimony oxide

1-butene adsorption and isomerization, ^{13}C -NMR study, **73**, 1
formation and surface composition, Mössbauer spectroscopy, **73**, 349

Titanate

Pt/TiO₂ interactions, XPS studies, **76**, 225

Titanium

V-Ti-O catalysts, activities in 3-picoline ammoxidation, ir spectra, **76**, 144

Titanium dioxide

formic acid dehydration
adsorption on electron-donor centers, NMR study, **74**, 89
ab initio SCF study, **74**, 84
nature of active centers, **74**, 77
-supported cobalt tetraphenylporphyrin, NO_x reduction, kinetics, **77**, 519
-supported Ir, metal-support interaction in hydrogenation, dehydrogenation, and hydrogenolysis, **75**, 243; **78**, 406
-supported metals as CO hydrogenation catalysts, **74**, 199
-supported Ni, strong metal-support interactions, interfacial effect, **78**, 389
-supported Pt, metal-support interactions, electrical conductivity, **78**, 425
-supported Rh, metal-support interaction in hydrogenation, dehydrogenation, and hydrogenolysis, **75**, 243
XPS, **77**, 301
-supported silver catalysts, electron exchange, **76**, 254
surface electronic properties and CO hydrogenation activity of Ni deposited on, **73**, 136

Toluene

alkylation with methanol on zeolite catalysts, selectivity for xylene isomers, **75**, 196
ammoxidation over V₂O₅/Al₂O₃, catalyst activity, **76**, 9
steam dealkylation over group V111 metal catalysts, role of support, **75**, 151

Tracers

C-13, surface carbon role in catalytic reactions, **74**, 405

Tracing

deuteromethane, CO/H₂ methanation over Ni catalyst, **75**, 314

Transfer

hydrogen, reaction between ethanol and acetone over magnesium oxide, **73**, 120

Transmission electron microscopy

Ni dispersions in reduced Ni faujasites, **74**, 188
sulfur on noble metal catalyst particles, **78**, 306

Trienes

and dienes, hydrocyanation over nickel(0)-phosphite complexes, **78**, 209

Triethylaluminum

effect of treatment on hydrogenation and hydrodesulfurization activity of Mo, Co, and Ni sulfide catalysts, **77**, 132

Triosmium

clusters bonded to phosphine-functionalized supports for olefin isomerization, **73**, 82

Tungsten

reactions of acetaldehyde and ethanol

W(100), **73**, 161

W(100) - (5 × 1), **73**, 161

Tungsten oxide

γ -alumina-supported, characterization, reducibility of oxidic state versus hydrodesulfurization activity of sulfided state, **76**, 241
silica-supported, active centers for metathesis and isomerization of alkenes, **78**, 17

9-Tungstophosphoric acid

properties and conversion of methanol to hydrocarbons, **77**, 473

12-Tungstophosphoric acid

properties and conversion of methanol to hydrocarbons, **77**, 473

12-Tungstosilicic acid

properties and conversion of methanol to hydrocarbons, **77**, 473

U

Ultra high-vacuum studies

CO interaction with small supported

Ni/mica particles, **73**, 91

Pd/mica, **73**, 104

V

Vanadium oxide

/Al₂O₃, activity in toluene ammoxidation, **76**, 9

interaction with 1-butene, temperature-programmed desorption, **75**, 112

NO reaction with NH₃, kinetics by pulse reaction, **74**, 144

/SiO₂, tetrahydrofuran vapor-phase oxidation to γ -butyrolactone, kinetics and XRD, **77**, 192

Vanadium pentoxide–titanium dioxide
o-xylene oxidation on monolayer catalyst, **77**, 309

Vanadium–phosphorus
 oxides, interaction with 1-butene, temperature-programmed desorption, **75**, 112

V–Ti–O catalysts
 activity in 3-picoline ammoxidation, ir spectra, **76**, 144

Vibrational-coupling model
 infrared spectra of NO adlayers on Pt, **78**, 225

W

Waste gases
 mercury removal by manganese oxide acceptors, **73**, 337

Water
 /CO on alkali-promoted alumina catalysts, **76**, 345
 /CO₂ uncatalyzed and Pt-catalyzed gasification of carbon, **75**, 337
 deuterated, methanol conversion to ethylene over ZSM-5 zeolite, **75**, 284
 effect on rhenium activity in ammonia synthesis, **78**, 142
 interaction with CO over supported Rh, **75**, 302
 photocatalyzed production of hydrogen by visible light, Mg- and Si-doped iron oxides for, **78**, 341
 –surface carbon interaction to form methane, role of hydrogen, **77**, 297

Water vapor
 –graphite reaction at low temperatures, methane production, **75**, 7

X

X-Ray photoelectron spectroscopy
 aldehydes and ketones on Fe(100), **74**, 55
 and Mössbauer emission spectroscopy of Co state in sulfided, supported, and unsupported Co–Mo catalysts, **77**, 397
 Phillips Cr/silica polymerization catalyst, **77**, 348
 Pt/TiO₂ interaction, **76**, 225
 Rh–TiO₂ interaction, **77**, 301
 strong metal–support interactions, **77**, 85
 sulfur on noble metal catalyst particles, **78**, 306

Xylenes
 isomerization
 and disproportionation over LaY zeolite catalyst, **75**, 291
 selectivity in toluene alkylation with methanol on zeolite catalysts, **75**, 196
 over ZSM-5 zeolites, selectivity, **76**, 418

o-Xylene
 oxidation on V₂O₅–TiO₂, **77**, 309
p-Xylenes
 selectivity in molecular sieve catalysts, mathematical theory, **76**, 433

Y

Yttrium
 Ni–Y, CO catalytic oxidation, **77**, 561
 Yttrium oxide
 methyl benzoate reduction on Y₂O₃ in infrared spectroscopic flow reactor, **76**, 274

Z

Zeolites
 electronegativity and catalytic properties, **73**, 205
 Fe–Y, interaction with nitric oxide, infrared and Mössbauer spectroscopy, **76**, 112
 HY, coke formation and nature of active sites with 1-hexene and 4-methylcyclohexene, Fourier transform infrared spectroscopy, **78**, 34
 –supported LaY, xylene isomerization and disproportionation, **75**, 291
 tellurium NaX, cyclohexane dehydrogenation to benzene, deuterium tracer studies, **73**, 361
 toluene alkylation with methanol, selectivity for xylene isomers, **75**, 196
 Y-type
 CO/H₂O conversion over Ru, **74**, 393
 Cr-exchanged, cracking, isomerization, and disproportionation of *n*-heptane, kinetics, **77**, 159
 modified, XPS study, **75**, 423
 Pt-stabilized, hydroisomerization of *n*-hexane
 comparison with reaction mechanism on Pt/mordenite, **78**, 275
 effect of Pt content, **78**, 267
 –supported Rh, CO/H₂O interaction, **75**, 302
 –supported Ru, reversible chemisorption of hydrogen and carbon monoxide, **78**, 182

ZSM-5

Cu-catalyzed hydrocarbon oxidation, **77**, 301
 methanol conversion to ethylene in presence of deuterated water, **75**, 284
 shape-selective support for Pt-catalyzed olefin hydrogenation, **77**, 304
 toluene disproportionation, **76**, 418
 toluene–methanol alkylation, **76**, 418
 xylene isomerization, **76**, 418
p-xylene selectivity, mathematical theory, **76**, 433

Ziegler–Natta catalysts
 steric control, analysis of nonbonded interactions at model catalytic sites, **77**, 32

- Zinc
 effect on surface properties of Co/Al₂O₃, **74**, 121
- Zinc oxide
 combined temperature-programmed desorption and
 infrared study of H₂ chemisorption, **73**, 396
- Zinc sulfide
 Co–Ni dispersion, propene hydrogenation, **76**, 164
- Zirconium oxide
 -supported Rh
 CO hydrogenation, **76**, 1
 CO₂ hydrogenation, **76**, 1
- Zirconium tungstate
 ethylene vapor-phase direct hydration, **77**, 554
 vapor-phase direct ethylene hydration, catalytic be-
 havior and kinetics, **77**, 23
- ZSM-5 zeolite
 phosphorus-modified, catalytic and physical prop-
 erties during methanol conversion, **73**,
 147