

A Journal of the Gesellschaft Deutscher Chemiker

# Angewandte Chemie

International Edition



www.angewandte.org

2007–46/38

2nd October Issue



150  
YEARS

SÜD-CHEMIE  
CREATING PERFORMANCE TECHNOLOGY



## Catalysis is the driving force ...

... of the chemical industry in general and of the corporation Süd-Chemie in particular. The 150th anniversary of Süd-Chemie in 2007—see the chronicle on the following pages—serves as an occasion for *Angewandte Chemie* to devote an entire issue to catalysis and in this way to congratulate this traditional yet global enterprise whose founding goes back to Justus von Liebig.

WILEY-VCH

## Süd-Chemie Milestones 1857 to 2005, Developments in 2006

In 1852, Baron Justus von Liebig was offered a chair at Munich University by the King of Bavaria, Maximilian II. A new institute with its own professorship was set up for him to conduct research into the basic chemical structure of nutrition. Liebig was the first person to realize that agricultural plants extract large amounts of nitrogen and phosphoric acid from the soil. To counteract this deficiency, Baron von Liebig created, with the aid of sulfuric acid, a solution of ordinary calcium phosphate and developed a fertilizer named superphosphate (Figure 1).

**1857** Federal councillor Baron Julius von Niethammer, Joseph von Hirsch, banker at the royal court, Professor of Agriculture Carl Nikolaus Fraas and the chemist Wilhelm Mayer, one of Liebig's students, joined forces to produce the new fertilizer and make it available for agricultural use. On 19 November they received a license from the Bavarian king, Maximilian II to found the Bayerische Aktiengesellschaft für chemische und landwirtschaftlich-chemische Produkte (Bavarian Public Limited Company for Chemical and Agrochemical Products), known as BAG. Baron von Liebig was one of the founding shareholders and a member of the administrative board.

**1858** On July 1st, the foundation stone was laid for a factory in Heufeld, near Munich. Manufacture of the first product, bone meal for use as a fertilizer, began in the summer of 1859 (Figure 2).

**1860** Besides producing bone meal, the company also began to manufacture sulfuric acid. From 1861 onwards, other products were added, including sulfate, hydrochloric acid, nitric acid, sodium sulfate, soda, and the urgently needed artificial fertilizer superphosphate, these later being supplemented by chlorinated lime and glue.

**1862** BAG was entered in the official register of companies. In the same year, one of the Heufeld products for combating acidic soil was awarded a Grand Medal at the World Exhibition in London.

**1863** The Bavarian Ministry of Trade and Public Works issued BAG with its first patent for a product named REICHENHALLER MUTTER-LAUGEN-EXTRAKT (Reichenhall Mother-Liquor Extract).

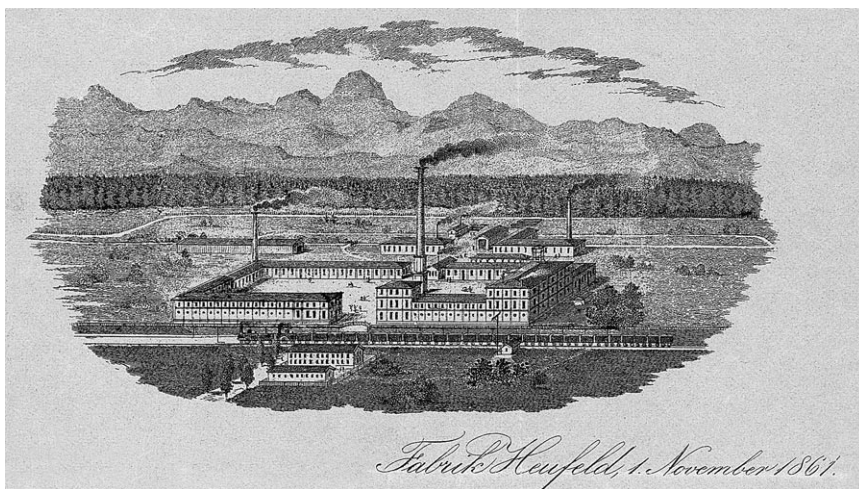
**1867** BAG recorded a profit for the first time and in 1868 distributed a dividend to its shareholders for the year 1867.



Figure 1. Justus von Liebig's chemistry laboratory, ca. 1840.



- 1877** After ten years of positive business performance, BAG suffered a serious setback. The first annual financial statements drawn up in reichsmarks showed hardly any profit. Trading conditions remained poor until the end of the 1880s.
- 1882** BAG was awarded the golden association's commemorative medal by the Bavarian Agricultural Association for its achievements in the field of chemical fertilizer production.
- 1890s** The fertilizer business recovered and was expanded. By 1901, BAG already maintained eight factory buildings.
- 1903** BAG patented a contact process for manufacturing sulfuric anhydride with the aid of pyrite cinders charged with iron sulfate, a reaction that was later to be termed catalysis.
- 1906** In the Lower Bavarian town of Kronwinkel, the second limb of today's Süd-Chemie was founded under the name Erdwerke Kronwinkel Franz Schmid & Co. GmbH (Kronwinkel Earthworks). The company mined silica, now known as bentonite, which was used to bleach oils and fats. Management of the company was subsequently taken over by August and Max Ostenrieder and by 1909, the works had progressively been relocated to Moosburg and renamed Tonwerk Moosburg A. & M. Ostenrieder GmbH (Moosburg Clayworks).
- 1908** Acidic activation was discovered at Tonwerk Moosburg (Figure 3), a process via which Bavarian bentonite can be refined to produce highly activated bleaching earth. This was needed to purify edible oils and refine petroleum. The first product was given the name Tonsil and is still part of Süd-Chemie's product portfolio today.
- 1921** BAG also began to produce bleaching earth.
- 1923** Sirius-Werke AG (Sirius Works plc) was founded in the Bavarian town of Deggendorf, also to produce bleaching earth. Thanks to rising petroleum consumption, the importance of bleaching earth was increasing.
- 1925** BAG took over operations for the manufacture of bleaching earth from Erdwerke München.
- 1930** To hold their own in the face of increasingly fierce competition, Tonwerk Moosburg, Sirius-Werke, and Tonsil-Werke GmbH in Schönebeck/Elbe amalgamated to form the company Vereinigte Bleicherdefabriken AG (United Bleaching-Earth Factories plc), VBF for short. VBF's joint central administration moved into offices at Lenbachplatz 6 in Munich, which today still house the Süd-Chemie AG headquarters.
- 1930s** VBF became BAG's main shareholder in 1934 and in 1937 financed the construction of new plants for the production of sulfuric acid at BAG.
- 1941** VBF and BAG merged to form Süd-Chemie AG, having its registered office at Lenbachplatz 6 in Munich. The engineer, Dr. Hermann Römer, was elected as its first Manag-



**Figure 2.** Heufeld plant, 1861.

ing Board Chairman. Upon its formation, the company operated plants in Deggendorf, Heufeld, Kelheim and Moosburg under his management (Figure 4).

- 1942** The main building on Lenbachplatz was badly damaged during an air attack by Allied Forces. The Deggendorf works were completely destroyed during the war.
- 1945** Allied troops freed Germany from NS rule and occupied all factories, including those belonging to Süd-Chemie. With the permission of the Americans, the manufacture of superphosphate, humus fertilizer, and bleaching earth was resumed. In the same year, sulfuric acid production also started in Kelheim under Allied supervision.
- 1949** Süd-Chemie's headquarters on Lenbachplatz were completely restored, its central administration returning to the building in the summer.
- 1952** The Moosburg works were expanded to create the world's most advanced manufacturing plant for highly activated bleaching earth. Süd-Chemie was already exporting its bleaching-earth products to over forty countries.
- 1956** Investment in the future. At a cost of around DM 1 million, Süd-Chemie erected a pilot plant for the manufacture of catalysts in Heufeld.
- 1957** Süd-Chemie celebrated its 100th anniversary, its centenary year being marked by sales of DM 50 million.
- 1959** Süd-Chemie successfully moved into the catalyst business by founding the Munich-based Girdler-Südchemie Katalysator GmbH as a joint venture with the US company, Chemetron Corporation. The new company distributed Girdler catalysts to Europe, Africa, and the Middle East.
- 1962** The company's first own catalyst factory was commissioned in Moosburg, manufacturing catalysts for fertilizer production and oil refining.
- 1965** The company's international growth in the bleaching-earth sector continued. Süd-Chemie founded Tonsil Mexicana S.A. de C.V. in Mexico (now Süd-Chemie de México, S.A. de C.V.; Figure 5).
- 1969** In France, Süd-Chemie founded Société Française des Bentonites et Dérivés S.A.S.

- 1970** Süd-Chemie AG became a 50% partner in Kernfest KG – Ashland-Südchemie-Giesserei-Chemikalien GmbH (now Ashland-Südchemie-Kernfest GmbH), taking over industrial management of the company for the production of foundry products.



Figure 3. Tonwerk Moosburg, ca. 1913.



- 1974** Süd-Chemie achieved a breakthrough on the American catalyst market by taking over Chemetron Corporation's catalyst operations, named Girdler Catalysts Division. Along with Girdler-Südchemie Katalysator GmbH in Germany, also Girdler-Chemical Inc. based in Louisville, USA and Nissan Chemetron Catalyst Ltd. in Japan were integrated, which were subsequently renamed Girdler Catalysts Inc. and Nissan Girdler Catalyst Ltd (Figure 6).
- 1976/77** Market presence was expanded further in the US. Süd-Chemie initially acquired an interest in Catalysts & Chemicals Inc. (CCI), subsequently merging this company with Girdler Catalysts to form a new enterprise, United Catalysts Inc. (now Süd-Chemie Inc.) based in Louisville. As a result of this merger, a joint venture with a prestigious Indian commercial family, United Catalysts India Ltd. (now Süd-Chemie India Pvt. Ltd.) was also integrated into Süd-Chemie.
- 1979** The formation of African Catalysts (Pty) Ltd. (now Süd-Chemie Sasol Catalysts (Pty) Ltd) added another continent to the Süd-Chemie map. In 1981, a factory for the production of catalysts used in coal refining was commissioned in South Africa.
- 1980s** As of 1983, Süd-Chemie's catalyst operations comprised seven companies in the US, Japan, South Africa, Belgium, India, and Kuwait. Süd-Chemie expanded its presence in the adsorbents sector in Asia by forming Industrial Minerals of Korea (now Süd-Chemie Korea Co., Ltd.) in 1985 and P.T. Sud-Chemie Indonesia in 1987.
- 1990** As a result of international expansion, the Süd-Chemie Group came into being. In addition to Süd-Chemie AG, it comprised 59 holdings around the globe, with more than 30 production plants and over 4000 employees. Sales reached the DM 1 billion level. In South Africa, the joint venture Syncat (Pty) Ltd (now Süd-Chemie Zeolites (Pty) Ltd) began producing zeolite catalysts.
- 1993** Süd-Chemie brought its structure into line with the challenges presented by the increasing rate of globalization. A new unit for environmental technology was added to the existing units for clay chemistry and catalysts.
- 1995** Süd-Chemie acquired the catalyst operations owned by EniChem S.p.A. in Italy. For the first time, environmental audits were successfully conducted at all Süd-Chemie AG production sites in Germany and at Süd-Chemie Inc. in the US, all plants receiving the relevant approvals.
- 1996** Following takeover of the French company Airsec S.A.S., Süd-Chemie also began to supply desiccants to the pharmaceutical industry.
- 1997** In Italy, Süd-Chemie expanded its catalyst activities in the sector of catalysts used in the manufacture of resin and polymer products by taking over Montecatini Technologie S.p.A. (now Süd-Chemie Catalysts Italia S.r.l.). In Peru, a producer of bleaching earth, Arcillas Activadas Andinas S.A. (now Süd-Chemie Peru



Figure 4. The first Süd-Chemie AG share in 1941.

S.A.) was acquired. Meanwhile, a second factory was constructed in South Africa to increase the production capacity for zeolite catalysts.

- 1998** By acquiring the SEC catalyst business from Degussa AG, Süd-Chemie was able to expand its portfolio in the sector of exhaust reduction catalysts.
- 1999** Süd-Chemie purchased Fulmont Argilas Ativadas Ltda. (today Süd-Chemie do Brasil Ltda.) to expand its production facilities in Brazil in response to the rising demand for bleaching earth in Latin America.
- 2000** Merger of the two Japanese companies, Süd-Chemie Nissan Catalysts Inc. and Catalysts and Chemicals Inc., Far East, gave rise to one of the largest catalyst manufacturer in Japan, Süd-Chemie Catalysts Japan, Inc. In all, some 5000 employees across the world generated sales of more than EUR 800 million for the Süd-Chemie Group.
- 2001** After concentrating German catalysts activities at the Heufeld site, the plant was expanded to become Süd-Chemie's European catalysis center.
- 2002** Süd-Chemie formed a joint venture in China, Panjin Süd-Chemie Liaohe Catalyst Co., Ltd., becoming the first Western enterprise in the field of chemical and petrochemical catalysts to hold a majority interest in a Chinese company. In the adsorbents sector, Süd-Chemie Redhill Bentonite (Liaoning) Co., Ltd. was established as China's largest manufacturer of high-quality bentonite for the foundry industry.
- 2003** Süd-Chemie's product portfolio in the field of ethylene oxide catalysts was expanded following formation of the US joint venture, Scientific Design Company, Inc., together with Saudi Basic Industries Corporation (SABIC).
- 2004** Business in the foundry-chemical sector was increased by acquiring the worldwide distribution activities from SKW Metallurgie AG. In Qatar, Süd-Chemie decided to form a joint venture, Süd-Chemie Qatar W.L.L., for the production and distribution of gas-to-liquid (GTL) catalysts.
- 2005** Süd-Chemie purchased a majority interest in the Canadian company, Phostech Lithium Inc., which manufactures lithium iron phosphate for high-performance lithium-ion batteries, and in the Chinese company, Shanghai Süd-Chemie Jinhai Catalysts Co., Ltd., engaged in the manufacture of polymerization catalysts. The Performance Additives Business Unit (rheology) was sold.



**Figure 5.** Süd-Chemie founded Tonsil Mexicana S.A. de C.V. in Mexico (now Süd-Chemie de México, S.A. de C.V.) in 1965.

## Developments 2006

### January

At the beginning of the year, the Industry Group for Waste Water Treatment and Process Technology was hived off from the Adsorbents and Additives Business Unit and integrated into the Water Treatment Business Unit as part of the Industry Group for Potable, Effluent and Specialty Applications.

As of 1 January 2006, Süd-Chemie acquired WD-Giesserei-Technik GmbH, Fuldabrück which specializes in the manufacture of cores for the foundry industry.

The financial investor One Equity Partners LLC, New York, USA acquired a total of 39.2% of the shares in Süd-Chemie AG via SC-Beteiligungsgesellschaft mbH, Frankfurt, becoming Süd-Chemie AG's largest shareholder.

### February

The Heufeld plant, which houses Europe's most advanced catalyst production facilities, marked 1000 days of accident-free operation, far exceeding the previous record of 683 days without accident.

### March

Süd-Chemie took over a majority interest in Süd-Chemie (Schweiz) AG, based in Broc, Switzerland. Its partner in this joint venture in the pharmaceutical-packaging sector is Plaspaq SA, Broc, Switzerland.

On the occasion of the 2005 National Supplier of the Year Awards, DaimlerChrysler South Africa honored Süd-Chemie with the Best Non-Production Supplier Award.

### April

Dr. Jürgen F. Kammer, Chairman of the Supervisory Board at Süd-Chemie AG informed the Supervisory Board that he would no longer be standing for election to the Supervisory Board at the forthcoming Annual General Meeting due to the new shareholder constellation resulting from recent changes.

As in 2002 and 2003, the Saudi petrochemical group, Saudi Basic Industries Corporation (SABIC) presented Süd-Chemie with its Supplier Recognition Award for the third time for outstanding performance in the fields of product quality, on-time delivery, and applications engineering services during 2005.

### May

At its Moosburg plant, Süd-Chemie celebrated 100 years of bleaching-earth production.

### June

At the Annual General Meeting, the six shareholders' representatives were elected to the Supervisory Board following expiry of their previous term of office. New to the Supervisory Board were the shareholders' representatives Christoph Giuliani, Dr. Hans Heinrich von Srbik, and Konstantin Winterstein, as well as Johann Meier, who was newly elected by those employees entitled to vote. At the Supervisory Board Meeting



**Figure 6.** Breaking into the catalysts business—Süd-Chemie takes over Girdler Catalysts and Catalysts & Chemicals in 1974.



which followed the Annual General Meeting, Dr. Dietrich Schulz was elected Chairman and Christoph Giuliani Deputy Chairman. Süd-Chemie sold its Pet Products Business Unit, consisting of the company H. von Gimborn GmbH, Emmerich and its subsidiaries, to the German financial investor Capiton AG. All 278 employees, including 112 at the Emmerich site, were taken over.

**July**

Süd-Chemie renegotiated its syndicated loan for EUR 200 million, first granted in December 2004, at significantly improved conditions. The term of the credit commitment was extended to a total of seven years, based on the conditions valid for a five-year term, with two one-year renewal options. There was also a substantial reduction in the number of banks participating in the consortium.

**August**

For the second time, Süd-Chemie was presented with the luminous award by Sasol Synfuels International (Pty) Ltd in Johannesburg, South Africa for exceptional achievements as its best supplier in the materials category.

**September**

Süd-Chemie began to expand its hydrotalcite production at the Moosburg site in response to the high global demand for heavy-metal-free PVC additives, which are also expected to register strong future growth. At Heufeld, work begins on the further expansion of the R&D laboratory, which will be doubled in area and capacity by the end of 2008.

**October**

Süd-Chemie entered into a cooperation agreement in the sector of sterile pharmaceutical packaging with the American pharmaceutical-packaging manufacturer, Medical Instill Technologies Inc. (MedInstill), based in New Milford.

By taking over the catalyst manufacturer, Tricat Zeolites GmbH in Bitterfeld, Süd-Chemie was able to expand its capacity for the production of zeolite catalysts.

After laying the foundation stone, work began in Mesaieed, Qatar on construction of a production plant for gas-to-liquid (GTL) catalysts, which is scheduled to be commissioned at the end of 2007.

**November**

Together with the German subsidiary owned by Inco Ltd., a Canadian supplier of nickel and specialized nickel products headquartered in Toronto, Süd-Chemie formed the joint venture, Alantum GmbH & Co. KG in Sauerlach to develop diesel exhaust catalysts and particulate filters for the automobile industry.

**December**

Süd-Chemie Inc., Louisville, USA and csp Technologies Inc., Auburn, USA settled their dispute involving the infringement of patent rights by Süd-Chemie Inc.

At the end of the year, the Canadian company Phostech Lithium Inc., Montréal, in which Süd-Chemie holds a majority interest, completed construction of a production line in St. Bruno, Canada, offering an annual capacity of 300 tons of lithium iron phosphate. Following enlargement of this production line based on an investment volume of about EUR 4 million, its capacity will increase to over 900 tons. During 2007 and 2008, additional capital expenditure of some EUR 23 million is planned.

At year end, the Industry Group for Energy Storage was formed as part of the Energy and Environment Business Unit to meet the rapid expansion of business activity with lithium iron phosphate, a new cathode material for lithium-ion batteries.

## **2007 Süd-Chemie celebrates its 150th anniversary.**

---