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## Phosphorus, Sulfur, and Silicon and the Related Elements

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## Phosphinophenolato Complexes for Use in Ethene Poly/Oligomerization

J. Heinicke<sup>a</sup>; M. Köhler<sup>a</sup>; M. He<sup>a</sup>; N. Peulecke<sup>a</sup>; W. Keim<sup>b</sup>

<sup>a</sup> Ernst-Moritz-Arndt-Universität Greifswald, Germany <sup>b</sup> Institut für Technische Chemie, Germany

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## PHOSPHINOPHENOLATO COMPLEXES FOR USE IN ETHENE POLY/OLIGOMERIZATION

J. Heinicke,<sup>a</sup> M. Köhler, M. He,<sup>a</sup> N. Peulecke,<sup>a</sup> and W. Keim<sup>b</sup>  
Ernst-Moritz-Arndt-Universität Greifswald, Germany<sup>a</sup>  
and Institut für Technische Chemie, Germany<sup>b</sup>

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2-Phosphinophenolato-*P,O*-Ni( $\eta^5$ -Cp) **1**, bis(2-phosphinophenolato-*P,O*)Ni **2**,<sup>1</sup> (2-phosphinophenolato-*P,O*)Ni( $\eta^3$ -methallyl) **3**, hemilabile (2-phosphinophenolato-*P,O*)Ni( $\eta^3$ -methallyl)SbF<sub>6</sub> **4**,<sup>2</sup> and (2-phosphinophenolato-*P,O*)methylnickel(PMe<sub>3</sub>) **5**<sup>3</sup> were synthesized from 2-phosphinophenols and NiCp<sub>2</sub>, methallylNiBr or [NiMe(OMe)(PMe<sub>3</sub>)]<sub>2</sub>, respectively. The thermally more labile complexes **3–5** catalyze the C—C coupling of ethene whilst **1** and **2** remain inactive under equal conditions. **3** provides linear polymers, **4** affords isomer mixtures of branched oligomers while **5** produces linear oligomers if sufficiently activated by *P*-alkyl groups. Formation of complexes of type **2** is regarded to terminate the catalytic process.<sup>1–3</sup> In case of 2-diphenylphosphino derivatives **2** can be reactivated using excess NiX<sub>2</sub> and NaH, but the reaction rate is much slower than with **3**. Probably the generation of the active catalyst at the surface of the least soluble component is the rate-limiting step.<sup>2</sup>

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Address correspondence to J. Heinicke, Institut für Chemie und Biochemie, Ernst-Moritz-Arndt-Universität Greifswald, 17487 Greifswald, Germany.  
E-mail: heinicke@uni-greifswald.de