New Database for non-oxide refractory systems (SPRefr)

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ABSTRACT

The SpencerGroup (Dr. Philip Spencer) has developed recently a new database for *non-metal refractory systems*. It will be available for use with *FactSage* with the next release of *FactSage*.

Below is given a short list of the major features of this database.

- **Non-metal elements: B, C, N,** *and* **Si** with metal components **Al, Ca, Co, Cr, Fe, Hf, Mg, Mn, Mo, Nb, Ni, Re, Sc, Ta, Tc, Ti, V, W, Y, Zr**

- Relates to the ever-expanding field of *non-oxide refractories* based on carbides, nitrides, borides and silicides.

- Applications: hard, high melting temperature materials used in *furnace construction, high-temperature coatings, cutting tools, abrasives, aircraft brake linings, rockets, jets, turbines,* and *nuclear power plants.*

- Also as *precipitates* in *steels* and *light alloys* to give improved properties through added strength, hardness, and grain refining. (Combine with **FTLite** and **FSStel**)

- Reactions of the carbide, nitride, boride and silicide systems **with refractory oxides** and **oxygen-containing gases** can be calculated by *combining* the **SPRefr** database together with such databases as **FToxid, FACTPS** and **SGPS**.

- Assessed thermodynamic parameters available for binary and ternary systems

- Major subsystems: Me1-Me2-C, Me1-Me2-N, Me1-Me2-B, Me1-Me2-Si, Me-C-N, Me-C-B, Me-C-Si, Me-N-B, Me-N-Si and Me-B-Si

- Total number of systems: appr. 180 binary, and over 200 ternary systems

- Total number of phases: 311 solutions and appr. 470 stoichiometric compounds