Magnesium alloys and oxygen

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Understanding the reactions between liquid magnesium alloys and oxides is important for melting and casting of Mg alloys. Knowledge of interactions between solid Mg alloys and various oxides is important for understanding the behavior of embedded oxide particles and interfacial reactions. This work presents a comprehensive thermodynamic description of Mg alloys and oxides. High-quality data on the alloy side are most important if limiting applications to about 1000°C where liquid oxides are generally irrelevant. This presentation focuses on the Mg-Ca-O system with a full assessment, without that temperature limit, and presents:

Study of oxygen solubility in liquid Mg and the first realistic Mg-O binary phase diagram.

Mg-O solubility data are supported by comprehensive comparative assessment of oxygen in liquid elements and full assessment of the related Ca-O system.

Comprehensive assessment of the Mg-Ca-O ternary system revealing alloy-oxygen-oxide interactions supported by experimental in situ data on Mg-rich alloy reactions with CaO.