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Be-Hg (Beryllium-Mercury)

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No phase diagram was proposed in the evaluation of the Be-Hg system by [1987Oka]. Recently, [2004Gum] sketched a provisional Be-Hg phase diagram shown in Fig. 1 (the allotropic transformation of Be has been added). Theoretical predictions of [1983Nie] suggested a pronounced tendency to immiscibility of Be and Hg. This is confirmed by the very limited solubility of Be in liquid Hg {1.3×10^{-4} at.%) at 371 °C [1964Wan], $<1 \times 10^{-5}$ at.% at 25 °C [1986Jed], $\geq 7 \times 10^{-6}$ at.% Be at 25 °C [1991Kli] and an overestimated value of 0.05 at.% Be at room temperature [1963Zuc]}, as well as in solid Hg ($<10^{-4}$ at.% Be at –40 °C [1971Ale]). Although insufficiently documented by experiments, a possible formation of $BeHg_2$ reported earlier [1987Oka] seems to be possible if a partial Gibbs free energy of Be (about –80 kJ/mol Be) is taken. This value for a dilute amalgam was estimated from the difference between the normal Be(II)/Be and polarographic half wave potential of Be(II) reduction on an Hg electrode [1975Nug]; the electrode process should be reversible and without subsequent reactions, but this was not exhaustively tested. Be undergoes a fair corrosion in Hg like Ti and Zr, which form stable intermetallics with Hg [1965Nej].

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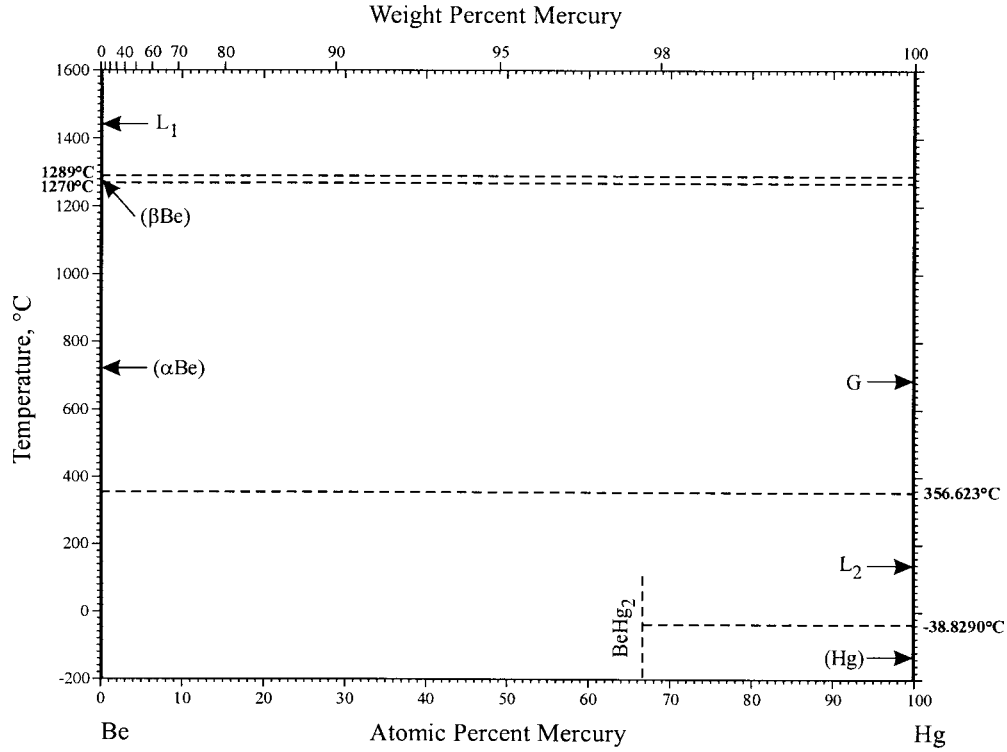

Fig. 1 Be-Hg phase diagram