

Surface Tension of KPO_3 - WO_3 Melts

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The temperatures T_{liq} of molten $x\text{WO}_3$ -(1 - x) KPO_3 mixtures with a molar content between $x = 0$ and $x = 0.60$ have been determined by differential thermal analysis. The surface tension of the $x\text{WO}_3$ -(1 - x) KPO_3 melts in the interval from $x = 0$ to $x = 0.5$ has been measured by ring tensiometry for temperatures 10 K – 20 K above the melting points, up to 1373 K. The data obtained for KPO_3 were fitted by a linear dependence on the temperature and compared with data available in the literature. The surface tension of the $x\text{WO}_3$ -(1 - x) KPO_3 melts was found to decrease non-monotonously with x . Three bends at $x \sim 0.15$, 0.30, and 0.45 were observed in the surface tension vs. molar fraction curve. The first and the third bends correspond to eutectic compositions; the second one is related to the formation of congruently melting $\text{K}_2\text{WO}_2\text{P}_2\text{O}_7$. Equations describing the temperature and concentration dependences of the surface tension are proposed.

Key words: Molten Salts; Differential Thermal Analysis; Surface Tension; Ring Tensiometry.