

PHOTOEMISSION FROM LIQUID Li-Pb ALLOYS

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PHOTOEMISSION FROM LIQUID Li-Pb ALLOYS

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Abstract. A photoelectron spectrometer has been developed for the measurement of liquid metals and alloys which are volatile and have melting points up to 1500°C. Low energy ($h\nu = 21.2$ eV) photoemission spectra are presented for liquid $\text{Li}_x\text{Pb}_{1-x}$ alloys for $0 \leq x \leq 0.67$. For $x \approx 0$ they confirm the deviation from the nearly free electron picture characteristic of heavy polyvalent metals (1) showing separated 6s and 6p bands. At higher Li concentrations a broad peak appears at 2.6 eV below the Fermi edge, near the bottom of the Pb 6p band, which is tentatively associated with a bonding state. The Pb 6s band, which lies below -5 eV, is not significantly affected by alloying. The binding energy of the Pb $5d_{5/2}$ level was determined for all compositions. It is suggested that the small shift 0.3 eV towards the Fermi level does not accord with a simple ionic model which involves the complete filling of the Pb 6p shell as the stoichiometric composition Li_4Pb is approached.

Reference

1. Wotherspoon J.T., Rodway, D.C. and Norris, C., 1980, *Phil. Mag.* **B40**, 51.