

Quiz (Electrolysis of Molten Electrolytes)

- (a) Predict the products formed at each graphite electrode when a direct current is passed into
- (i) molten lead(II) bromide, and
 - (ii) solid lead(II) bromide.
- (b) If the answers in (a)(i) and (a)(ii) are different, explain why there is such a difference.
- (c) Write half equations for the reactions at the electrodes.

Suggested Answer

(a) (i) At the anode: bromine
At the cathode: lead

(ii) No electrolysis takes place.

(b) Molten lead(II) bromide contains mobile ions so it can conduct electricity. The ions in solid lead(II) bromide are not mobile. It does not conduct electricity. Hence, no electrolysis takes place.

(c) At the anode: $2\text{Br}^-(l) \longrightarrow \text{Br}_2(g) + 2e^-$
At the cathode: $\text{Pb}^{2+}(l) + 2e^- \longrightarrow \text{Pb}(l)$