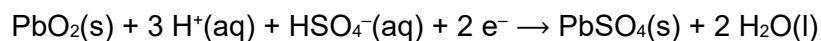**Q1.**
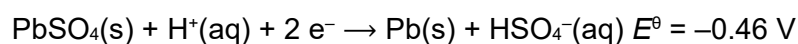
A cell with EMF = +2.15 V is made from two electrodes.

The half-equations for the two electrodes are shown.

Positive electrode:

$$PbO_2(s) + 3\ H^+(aq) + HSO_4^-(aq) + 2\ e^- \longrightarrow PbSO_4(s) + 2\ H_2O(l)$$

Negative electrode:

$$PbSO_4(s) + H^+(aq) + 2\ e^- \longrightarrow Pb(s) + HSO_4^-(aq)\ E^\ominus = -0.46\ V$$

What is the standard electrode potential of the PbO_2 / $PbSO_4$ electrode?

A   –2.61 V   ⬭

B   –1.69 V   ⬭

C   +1.69 V   ⬭

D   +2.61 V   ⬭

(Total 1 mark)

Q2.

Which statement correctly describes a trend down Group 7 from Cl to I?

X represents Cl, Br or I

A   The boiling point of HX increases.   ⬭

B   The bond dissociation energy of H–X increases.   ⬭

C   The standard electrode potential value for
     $X_2(aq) + 2\ e^- \longrightarrow 2\ X^-(aq)$ becomes more positive.   ⬭

D   The solubility of AgX in ammonia increases.   ⬭

(Total 1 mark)

Q3.

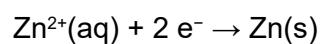Which change to a hydrogen electrode has **no** effect on the electrode potential?

A the concentration of the hydrogen ions ☐

B the pressure of the hydrogen ☐

C the surface area of the platinum electrode ☐

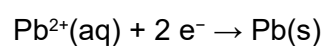**D** the temperature of the acid ☐

(Total 1 mark)

Q4.
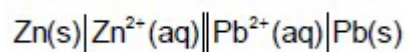
Some electrode potential data are shown.

$$Zn^{2+}(aq) + 2\ e^- \rightarrow Zn(s) \qquad\qquad E^\ominus = -0.76\ V$$
$$Pb^{2+}(aq) + 2\ e^- \rightarrow Pb(s) \qquad\qquad E^\ominus = -0.13\ V$$

Which is a correct statement about this cell?

$$Zn(s)\big|Zn^{2+}(aq)\big\|Pb^{2+}(aq)\big|Pb(s)$$

A Electrons travel in the external circuit from zinc to lead. ☐

B The concentration of lead(II) ions increases. ☐

C The maximum EMF of the cell is 0.89 V ☐

D Zinc is deposited. ☐

(Total 1 mark)