

Question	Marking Guidance	Mark	Comments
4(a)	HCl 1.0 mol dm <sup>-3</sup>	1	Allow H <sub>2</sub> SO <sub>4</sub> 0.5 mol dm <sup>-3</sup> Allow HNO <sub>3</sub> 1.0 mol dm <sup>-3</sup> Allow name or formula Concentration can be given after “conditions”
	(Hydrogen at) 100kPa / 1 bar	1	
	298 K	1	
4(b)	Pt / Platinum	1	Mark on if no answer for M1 If wrong answer for M1, only mark on if electrode is Au, Ag, Pb or Ti
	Inert / unreactive / does not create a potential difference	1	
	Conducts electricity / allows electron flow / conducts / conductor	1	
4(c)	KCl	1	Allow NaCl, KNO <sub>3</sub> , Na <sub>2</sub> SO <sub>4</sub> etc NOT NH <sub>4</sub> Cl
	Does not react with either electrode / solution in electrode	1	Allow unreactive / inert
	Ions can move	1	Allow conducts electricity / electrical connection / carries charge Do not allow just connects / completes the circuit Do not allow conducts / carries electrons Mark these independently

4(d)	$\text{Pt} \text{H}_2 \text{H}^+  \text{Fe}^{3+},\text{Fe}^{2+} \text{Pt}$	1	Ignore state symbols Order must be correct   must be correct but allow   instead of , separating $\text{Fe}^{3+}$ from $\text{Fe}^{2+}$ Allow , instead of   separating $\text{H}_2$ and $\text{H}^+$
4(e)(i)	$2\text{Fe}^{3+} + \text{H}_2 \rightarrow 2\text{Fe}^{2+} + 2\text{H}^+$	1	Allow multiples
4(e)(ii)	The $\text{Fe}^{3+}$ ions would be used up / reaction completed	1	Answer must relate to reactants in 4(e)(i) equation if given Allow reactant / reactants used up Do not allow concentration of $\text{Fe}^{3+}$ decreases Allow concentration of $\text{Fe}^{3+}$ falls to zero