Question	Marking Guidance	Mark	Comments
6(a)	Variable / many oxidation states	1	
6(b)	$V_2O_5 + SO_2 \rightarrow V_2O_4 + SO_3$ $V_2O_4 + ½O_2 \rightarrow V_2O_5$	1 1	Equations can be in either order Allow multiples
6(c)(i)	In a different phase / state <u>from reactants</u>	1	
6(c)(ii)	Impurities poison / deactivate the catalyst / block the active sites	1	Allow (adsorbs onto catalyst AND reduces surface area)
6(d)(i)	The catalyst is a reaction product	1	
6(d)(ii)	Mn^{2+}/ Mn^{3+} ion(s)	1	
6(d)(iii)	$4Mn^{2+} + MnO_4^- + 8H^+ \rightarrow 5Mn^{3+} + 4H_2O$ $2Mn^{3+} + C_2O_4^{2-} \rightarrow 2Mn^{2+} + 2CO_2$	1 1	Equations can be in either order