

10. Which one of the following reactions will be spontaneous under standard conditions?

- (a) $\text{Cr}_2\text{O}_7^{2-}(\text{aq}) + 3 \text{H}_2\text{O}_2(\text{aq}) + 8 \text{H}^+(\text{aq}) \rightarrow 2 \text{Cr}^{3+}(\text{aq}) + 7 \text{H}_2\text{O}(\text{l}) + 3 \text{O}_2(\text{g})$
- (b) $3 \text{O}_2(\text{g}) + 4 \text{Au}(\text{s}) + 12 \text{H}^+(\text{aq}) \rightarrow 4 \text{Au}^{3+}(\text{aq}) + 6 \text{H}_2\text{O}(\text{l})$
- (c) $2 \text{Ag}^+(\text{aq}) + 2 \text{Br}^-(\text{aq}) \rightarrow 2 \text{Ag}(\text{s}) + \text{Br}_2(\text{l})$
- (d) $2 \text{Cl}^-(\text{aq}) + \text{I}_2(\text{s}) \rightarrow \text{Cl}_2(\text{g}) + 2 \text{I}^-(\text{aq})$