

Exercise 3.33 – Periodic table trends

Q333-01 The chemical family which readily forms anions is the

- A. alkali metals
 - B. alkaline earth metals (Group 2).
 - C. transition elements.
 - D. halogens.
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Q333-02 Which general trends are correct for the oxides of the period 3 elements (Na₂O to Cl₂O)?

- I Acid character decreases
- II Electrical conductivity (in the molten state) decreases
- III Bonding changes from ionic to covalent

- A. I and II only
 - B. I and III only
 - C. II and III only
 - D. I, II and III
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Q333-03 Which of the following displacement reactions is possible?

- A. $\text{Br}_2(\text{aq}) + 2\text{Cl}^-(\text{aq}) \longrightarrow 2\text{Br}^-(\text{aq}) + \text{Cl}_2(\text{aq})$
 - B. $\text{I}_2(\text{aq}) + 2\text{Cl}^-(\text{aq}) \longrightarrow 2\text{I}^-(\text{aq}) + \text{Cl}_2(\text{aq})$
 - C. $\text{Cl}_2(\text{aq}) + 2\text{I}^-(\text{aq}) \longrightarrow 2\text{Cl}^-(\text{aq}) + \text{I}_2(\text{aq})$
 - D. $\text{I}_2(\text{aq}) + 2\text{Br}^-(\text{aq}) \longrightarrow 2\text{I}^-(\text{aq}) + \text{Br}_2(\text{aq})$
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Q333-04 Which of the following reactions is/are spontaneous?

- I $\text{Cl}_2 + 2\text{Br}^- \longrightarrow 2\text{Cl}^- + \text{Br}_2$
- II $\text{Br}_2 + 2\text{I}^- \longrightarrow 2\text{Br}^- + \text{I}_2$

- A. I only
 - B. II only
 - C. Both I and II
 - D. Neither I nor II
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Q333-05 Which combination will produce a reaction?

- A. $\text{Cl}_2(\text{aq}) + 2\text{I}^-(\text{aq})$
 - B. $\text{Br}_2(\text{aq}) + 2\text{Cl}^-(\text{aq})$
 - C. $\text{I}_2(\text{aq}) + 2\text{Br}^-(\text{aq})$
 - D. $\text{I}_2(\text{aq}) + 2\text{Cl}^-(\text{aq})$
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Q333-06 Bromine can be produced by

- A. oxidizing Br⁻ with I₂.
 - B. oxidizing Cl₂ with Br⁻.
 - C. oxidizing Br⁻ with Cl₂.
 - D. oxidizing I⁻ with Br⁻.
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Q333-07 Which statement is correct for the halogen group?

- A. Halide ions are all reducing agents with iodide ions being the weakest
 - B. Halogens are all oxidizing agents with chlorine being the strongest
 - C. Chloride ions can be oxidized to chlorine by bromine
 - D. Iodide ions can be oxidized to iodine by chlorine.
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Q333-08 Why do the boiling points of the halogens increase down the group?

- A. There is an increase in bond enthalpy
 - B. There is an increase in bond polarity
 - C. There is an increase in the strength of temporary dipoles
 - D. There is an increase in electronegativity
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Q333-09 Which reaction results in the formation of a coloured substance?

- A. $2\text{Li(s)} + \text{H}_2\text{O(l)} \longrightarrow 2\text{LiOH(aq)} + \text{H}_2\text{(g)}$
 - B. $2\text{Na(s)} + \text{Cl}_2\text{(g)} \longrightarrow 2\text{NaCl(s)}$
 - C. $\text{Cl}_2\text{(g)} + 2\text{NaI(aq)} \longrightarrow 2\text{NaCl(aq)} + \text{I}_2\text{(s)}$
 - D. $\text{Ag}^+\text{(aq)} + \text{Cl}^-\text{(aq)} \longrightarrow \text{AgCl(s)}$
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Q333-10 Which two elements react most vigorously with each other?

- A. Chlorine and lithium
 - B. Chlorine and potassium
 - C. Iodine and lithium
 - D. Iodine and potassium
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