

Name _____ Date _____

End of Chapter 10 test

This test and its sample answers have been written by the authors. IB may award marks differently.

- 1 In which of the following does the second element have the higher electronegativity?
 - A F, Br
 - B S, Si
 - C Se, Sn
 - D Si, Cl
- 2 Which of these elements has the lowest first ionisation energy?
 - A Cs
 - B Cl
 - C C
 - D Ca
- 3 In which of the following are the three species arranged in order of increasing radius?
 - A Na, Mg, Ca
 - B O^{2-} , F^- , Na^+
 - C Cl^- , S^{2-} , P^{3-}
 - D Na^+ , Mg^{2+} , Al^{3+}
- 4 In which substance does nitrogen have the lowest oxidation number?
 - A NO
 - B N_2O
 - C NO_2
 - D N_2O_4
- 5 Which trend is not correct down Group 1 ($\text{Li} \rightarrow \text{Cs}$)?
 - A Atomic radius increases.
 - B Ionic radius increases.
 - C First ionisation energy decreases.
 - D Metallic properties decrease.

- 6 Which one of the following has the greatest atomic radius?
- A Li
 - B Ne
 - C Na
 - D Mg
- 7 Which one of the following has the most exothermic first electron affinity?
- A F
 - B Cl
 - C Br
 - D I
- 8 Which of the following equations represents the second electron affinity of sodium?
- A $\text{Na}^+(\text{g}) \rightarrow \text{Na}^{2+}(\text{g}) + \text{e}^-$
 - B $\text{Na}(\text{s}) + \text{e}^- \rightarrow \text{Na}^-(\text{g})$
 - C $\text{S}^-(\text{g}) + \text{e}^- \rightarrow \text{S}^{2-}(\text{g})$
 - D $\text{Na}^-(\text{g}) + \text{e}^- \rightarrow \text{Na}^{2-}(\text{g})$
- 9 Which of the following compounds dissolves in water to produce a basic solution?
- I Na_2O
 - II Al_2O_3
 - III P_4O_{10}
- A I only
 - B II only
 - C I and II only
 - D I and III only
- 10 The oxidation state of nitrogen is the same in all of the following compounds except:
- A NH_3
 - B HNO_3
 - C $\text{Ca}(\text{NO}_3)_2$
 - D N_2O_5

11 Which of the following is correct for explaining the colour of transition metal complexes?

- A Visible light is emitted when electrons fall from a higher energy orbital to a lower energy orbital.
- B UV light is emitted when electrons fall from a higher energy orbital to a lower energy orbital.
- C Visible light is absorbed to promote electrons from a lower energy orbital to a higher energy orbital.
- D UV light is absorbed to promote electrons from a lower energy orbital to a higher energy orbital.

12 Which of the following compounds dissolves in water and forms a colourless solution?

- A CoCl_2
- B NiSO_4
- C $\text{Zn}(\text{NO}_3)_2$
- D KMnO_4

13 Which of the following compounds can act as a ligand in the formation of transition metal complex ions?

- I NH_3
- II NH_4^+
- III CO
- A I and II only
- B I and III only
- C II and III only
- D I, II and III

14 Which of these statements is not correct?

- A Rubidium would react less violently with water than potassium.
- B When potassium is added to water, an alkaline solution is obtained.
- C All Group 1 metals form a hydroxide with formula MOH .
- D When sodium reacts with water, hydrogen gas is produced.

15 Which of the following statements is correct?

- A All transition element complex ions are octahedral in shape.
- B All transition elements can form a $2+$ ion.
- C The maximum oxidation number of V is $+6$.
- D $[\text{CuCl}_4]^{2-}$ is coloured, as light is emitted when an electron falls from a higher energy d orbital to a lower energy d orbital.

END OF TEST