

## Atomic Structure

- 2 Element X has the electronic structure 2, 8, 3.

Which of the following statements about this element are correct?

- 1 The element is in Group 12, Period 3 of the Periodic Table.
- 2 The element reacts with oxygen to form a compound with the formula  $X_2O_3$ .
- 3 The element reacts with bromine to form a compound with the formula  $XBr_3$ .
- 4 The atomic number of the element is 13.
- 5 The element is an alkali metal.

- A 1 and 5 only  
B 2 and 3 only  
C 2 and 5 only  
D 3 and 4 only  
E 1, 4 and 5 only  
F 2, 3 and 4 only

2016

- 7 Nickel has an atomic number of 28. The mass numbers of four of its isotopes are 58, 60, 61 and 62.

Below are three statements about these isotopes of nickel.

- 1 All of them have the same chemical properties.
- 2 All of them have nuclei containing 28 protons.
- 3 One of them has a nucleus that contains 62 neutrons.

Which statement(s) is/are correct?

- A 1 only  
B 2 only  
C 3 only  
D 1 and 2 only  
E 1 and 3 only  
F 2 and 3 only  
G 1, 2 and 3  
H none of them

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**22** Which of the following have the same electron arrangement?



- A**  $^{39}_{19}\text{K}^+$ ,  $^{41}_{19}\text{K}^-$  and  $^{40}_{18}\text{Ar}$  only
- B**  $^{35}_{17}\text{Cl}^-$ ,  $^{36}_{17}\text{Cl}^+$  and  $^{40}_{20}\text{Ca}^+$  only
- C**  $^{35}_{17}\text{Cl}^-$ ,  $^{40}_{18}\text{Ar}$  and  $^{39}_{19}\text{K}^+$  only
- D**  $^{36}_{17}\text{Cl}^+$ ,  $^{40}_{18}\text{Ar}$  and  $^{41}_{19}\text{K}^-$  only
- E**  $^{40}_{20}\text{Ca}^+$ ,  $^{40}_{18}\text{Ar}$  and  $^{41}_{19}\text{K}^-$  only

# 2015

14 Which one of the following pairs do **not** have the same electronic structure?

[illegible]

- A  $\text{MgCl}_2$  and three atoms of argon
- B  $\text{CO}$  and  $\text{N}_2$
- C  $\text{CH}_4$  and  $\text{NH}_4^+$
- D  $\text{NO}_3^-$  and  $\text{CO}_3^{2-}$
- E  $\text{NaF}$  and two atoms of Ne

# 2013