



## Answers to 5116/ 5118 2014 O level Combined Science (Chemistry) Paper 3

- A1**
- (a) Galvanization (i.e. coating iron with zinc) will prevent iron from rusting.
  - (b) Fermentation requires a temperature between 25°C and 40°C, enzymes (eg. yeast) and anaerobic condition (i.e. absence of oxygen).
  - (c) Calcium hydroxide is used to reduce acidity of soil.
  - (d) Bitumen fraction of crude oil is used for road surfaces.
- A2**
- (a) Two other solids added to a blast furnace are coke and limestone.
  - (b) Iron ore (haematite) contains iron (III) oxide. Near the bottom of the blast furnace, iron (III) oxide reacts with coke (carbon) to form carbon monoxide.  
$$\text{Fe}_2\text{O}_3 + 3\text{C} \rightarrow 2\text{Fe} + 3\text{CO}$$
  
Carbon dioxide also reacts with coke to produce more carbon monoxide.  
$$\text{CO}_{2(g)} + \text{C}_{(s)} \rightarrow 2\text{CO}_{(g)}$$
  - (c) If metals are not recycled they can harm future generations:
    - (i) metal is a finite resource → unavailable for future generations
    - (ii) metal disposal → increase landfills → increase ground water pollution
  - (d) Plastics are harmful to the environment because
    - (i) incineration produces harmful gases
    - (ii) non-biodegradable → blocks drains/ water flow and harms marine life
- A3**
- (a) An element, Ea with 4 electron shells and 3 outermost electrons is found in period 4 and group 3 of the periodic table.
  - (b) Charge of the element is  $\text{Ea}^{3+}$
  - (c) Chemical formula of oxide is  $\text{Ea}_2\text{O}_3$ .

# O Level Science 5116 2014

**Henry Han,Tie Wei,Wenbin Liu,Fei Han**

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