

Suggested Answers on Note (Chapter 8) P.2

- (a) Lightest: Aluminium
Heaviest: Platinum
- (b) Gold, titanium and platinum
- (c) Copper, gold, iron, platinum, titanium and tungsten
- (d) Aluminium, copper, silver and platinum

Suggested Answers on Note (Chapter 8) P.4 – 6

1. Resists corrosion – window frame
Good conductor of heat – cooking pot
Good conductor of electricity – overhead cable
Low density – soft drink can

2.

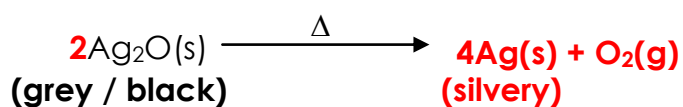
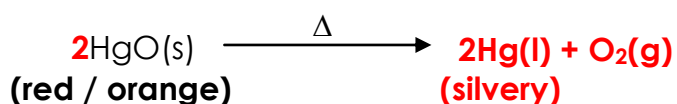
Article	Metal used	Properties that make the metal suitable for making the article
Soft drink cans	aluminium	strong, light, malleable, resists corrosion
Electric wires	copper	very good conductor of electricity, ductile, resists corrosion
Railings	iron	strong, ductile, cheap
Jewellery	gold	attractive yellow colour, resists corrosion, malleable and ductile
Light bulb filament	tungsten	very high melting point, gets 'white hot' without melting
Window frames	aluminium	strong, resists corrosion

3. (a) High electrical conductivity
(b) Aluminium – Low density, high electrical conductivity, high resistance to corrosion
4. (a) Silver has shiny silvery appearance which is attractive.
(b) The cost is very high. Pure metal is quite soft.
(c) Electroplating
5. The tensile strength is high and the cost is low.

6. (a) C - valuable
D – high tensile strength and high resistance to corrosion
- (b) D – high tensile strength, high resistance to corrosion and high electrical conductivity.
- (c) D – high tensile strength, high resistance to corrosion and low cost.

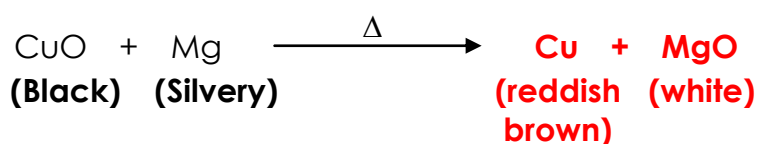
Suggested Answers on Note (Chapter 8) P.14 – 16

A. Metals low in the reactivity series



B. Extraction of Metals by Heating the Metal Oxides with Reducing Agent 還原劑

Reduction with metals: Competition for oxygen



Reduced by carbon by heating the oxides on a charcoal block.

e.g. Lead(II) oxide



e.g. Copper(II) oxide



Reduction of metal oxides with other reducing agents (e.g. CO, H₂)

e.g. Extraction of iron



Suggested Answers on Note (Chapter 8) P.17 – 18

1. (a) Reactivity of B < A, C, D
 (b) Reactivity of A > B, C, D
 (c) Reactive of B, C < A, D
 Conclusion: Reactivity A > D > C > B
2. (a) Too soft and low tensile strength. Does not resist corrosion.
 (b) (i) Low cost, high tensile strength.
 (ii) Poor resistance to corrosion. It rusts easily.
 (c) Resists corrosion better than iron. Less dense than iron but high tensile strength.
3. (a) D (high m.p.; metals conduct electricity in solid state)
 (b) C (ionic structures have high m.p.; conduct electricity when molten but not solid)
 (c) A (high m.p.; does not conduct electricity under any conditions)
 (d) B (low m.p.; does not conduct electricity under any conditions)

Suggested Answers on Note (Chapter 8) P.20

- (i) $\text{CaCO}_3(\text{s}) \xrightarrow{\Delta} \text{CaO}(\text{s}) + \text{CO}_2(\text{g})$
- (ii) $2\text{Ag}_2\text{CO}_3(\text{s}) \xrightarrow{\Delta} 4\text{Ag}(\text{s}) + 2\text{CO}_2(\text{g}) + \text{O}_2(\text{g})$
- (iii) $2\text{NaHCO}_3(\text{s}) \xrightarrow{\Delta} \text{Na}_2\text{CO}_3(\text{s}) + \text{CO}_2(\text{g}) + \text{H}_2\text{O}(\text{g})$
- (iv) $\text{Mg}(\text{HCO}_3)_2(\text{s}) \xrightarrow{\Delta} \text{MgCO}_3(\text{s}) + \text{CO}_2(\text{g}) + \text{H}_2\text{O}(\text{g})$
- (v) $\text{NaOH}(\text{s}) \xrightarrow{\Delta} \text{No reaction}$
- (vi) $\text{Ca}(\text{OH})_2(\text{s}) \xrightarrow{\Delta} \text{CaO}(\text{s}) + \text{H}_2\text{O}(\text{g})$
- (vii) $\text{Hg}(\text{OH})_2(\text{s}) \xrightarrow{\Delta} \text{Hydroxide not exist}$
- (viii) $2\text{NaNO}_3(\text{s}) \xrightarrow{\Delta} 2\text{NaNO}_2(\text{s}) + \text{O}_2(\text{g})$
- (ix) $2\text{Fe}(\text{NO}_3)_2(\text{s}) \xrightarrow{\Delta} 2\text{FeO}(\text{s}) + 4\text{NO}_2(\text{g}) + \text{O}_2(\text{g})$
- (x) $2\text{AgNO}_3(\text{s}) \xrightarrow{\Delta} 2\text{Ag}(\text{s}) + 2\text{NO}_2(\text{g}) + \text{O}_2(\text{g})$

Suggested Answers on Note (Chapter 8) P.22 – 24

1.

		Advantage(s)	Disadvantage(s)
(a)	a copper cooking pot with a glass one	<ul style="list-style-type: none"> • better appearance (transparent) • helps to conserve copper resources • no corrosion occurs 	<ul style="list-style-type: none"> • easily broken
(b)	an aluminium soft drink can with a plastic one	<ul style="list-style-type: none"> • lower density • helps to conserve aluminium resources 	<ul style="list-style-type: none"> • easily scratched
(c)	coins with money notes	<ul style="list-style-type: none"> • lower density • helps to conserve metal resources • no corrosion occurs • less storage space required 	<ul style="list-style-type: none"> • not as durable as coins • more easily forged • easily damaged

- 2.
- Recycle everything we can, e.g. newspapers, glass, cans, aluminium foils and pans, etc.
 - Return coat hangers to the cleaners.
 - Do not buy products with excess packaging.
- 3.
- (a) Iron(III) oxide
- (b) calcium carbonate $\xrightarrow{\Delta}$ calcium oxide + carbon dioxide
- (c) iron(III) oxide + carbon monoxide $\xrightarrow{\Delta}$ iron + carbon dioxide
- 4.
- (a) (i) Aluminium is lighter.
(ii) To increase the strength of the cables.
- (b) (i) The price of the metal will be lower.
(ii)
 - Greater use of titanium (lighter) structures
 - Greater use of stronger titanium items
 - New uses of titanium
 - Cheaper hip joint replacements