Cambridge International AS Level

Cambridge International Examinations
Cambridge International Advanced Subsidiary Level

PHYSICAL SCIENCE **8780/02**

Paper 2 Short Response **October/November 2016**

MARK SCHEME

Maximum Mark: 30

Published

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1 reading in Fig.1.1 = 0.39 and Reading in Fig.1.1 = 2.84 [1]
diameter = reading 2 – reading 1 = 2.45 mm [1]

2 **(a)** equation 1 $CaCO_3 \rightarrow CaO + CO_2$ [1]
equation 2 $CaO + SiO_2 \rightarrow CaSiO_3$ [1]

Answers in either order.

(b) clearly explains that in their acid / base equation, **SiO_2** is (a non-metal, so is an) **acidic** (oxide) and **CaO** is (a metal oxide, so is) **basic** [1]

3 **(a)** gravitational force / weight [1]

(b) **(i)** work = force × displacement in the direction of the force [1]

(ii) force is always at right angles to the velocity (of the satellite) OWTTE [1]

4 **(a)** $q = 50.0 \times 4.2 \times 6.7 = 1407$ (J) [1]

(b) deduces limiting amount of acid to be 0.025 mol [1]
$\Delta H_{neutralisation} = -1407 / .025 = (-)56.3$ (kJ mol^{-1}) [1]

5 force per unit charge [1]
positive / stationary (charge) [1]

6 **(a)** NaBr solution turns red / orange / brown / yellow **and**
NaF no change / stays colourless [1]

(b) no reaction occurs with NaF [1]
$F_2 > Cl_2$ as an oxidising agent [1]

OR

Br_2 is formed from NaBr (1)
$Cl_2 > Br_2$ as an oxidising agent (1)

7 **(a)** load = $(175 \times 9.81) - 686 = 1030$ (N) [1]

(b) $686 \times y = 1030 \times (6.0 - y)$ [1]
(distance) = 3.6 (m) [1]

8 **(a)** appropriate comparison, e.g. Mg with steam, **and** Ba reacts with (cold) water [1]

(b) **(i)** $Mg + H_2O \rightarrow MgO + H_2$ [1]

(ii) $Ba + 2H_2O \rightarrow Ba(OH)_2 + H_2$ [1]

9 **(a)** attempt to show $P = F/A = mg/A$ OR $\rho = m/V = m/Ah$ [1]

clear cancellation to $P = \rho h g$ [1]

(b) density changes with height / gravitational field changes with height [1]

10 **(a)** K has greater shielding / an extra shell than Ar [1]

(b) K^+ has same electron arrangement as Ar / is isoelectronic / has same shielding / has a full outer shell when an electron is removed [1]
K^+ has more protons than Ar, so smaller size / greater attraction from nucleus [1]

11 resistance of parallel pair is less than resistance of single resistor [1]

(therefore the) reading will reduce [1]