**Assessment schedule for Year 10 Science Topic Test ‘Structure of Matter’ 2014**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Question** | **Criteria** | **A** | **M** | **E** |
| **1a)** | ElementCompoundMixture | 2 correct |  |  |
| **b)** | In a solid the particles are touching and are locked together (bonding) so they cannot move (can vibrate/rotate) and so cannot take the shape of the container. In a liquid the particles touch but are free to move so they can take the shape of the container. In a gas the particles are not touching and are free to move and take up the whole container. | Correct diagram | Correct description of spacing, arrangement and movement of (s),(l),(g).Or Diagram and movement (s),(l),(g). | Merit + link of shape to container for (s),(l),(g). |
| **2a)** | 1. neutron
2. proton
3. electron
 | electron correctproton & neutron in nucleus | All correct |  |
| **b)** | 1. 0
2. +
3. –
 | neutron, 0proton, +consistent with 2a)  |  |  |
| **c)** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Symbol** | **Atomic****number** | **Mass****number** | **Number****of protons** | **Number of electrons** | **Number of neutrons** |
| Al | 13 | 27 | 13 | **13** | **14** |
| C | **6** | 12 | **6** | 6 | 6 |
| Na | 11 | 23 | 11 | **11** | 12 |
| O | 8 | 16 | **8** | 8 | 8 |

 | 4 correct | all correct |  |
| **3a)** | by losing or gaining electrons so that it has a full outer shell | loss or gain of e | A + full valence shell |  |
|  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sym** | **Name** | **# e** | **E con** | **Lose/gain** | **# l/g** | **Ion** |
| Na | **sodium** | 11 | **2,8,1** | **lose** | **1** | **Na+** |
| **N** | nitrogen | **7** | 2,5 | gain | **3** | **N3-** |
| Al | **Aluminium** | **13** | 2,8,3 | **lose** | **3** | **Al3+** |
| **S** | sulfur | 16 | **2,8,6** | **gain** | **2** | **S2-** |

 | Columns 1,2 and 3 | A + 5 and 6 | **M+4 and 7** |
| **c)** | Li, Na, K atoms* All have 1 valence (outer shell) electron
* They are all in group 1 on the periodic table
* They all lose 1 electron to form an ion
* All have lost 1 electron and therefore have a +1 charge (Na+, Li+, K+ ions)
* so they all react in the same way with other substances.
 |  2 correct point | 3 correct points | 4 correct points, must have last point |
| **d)** | He, Ne, Ar all* Have full outer/valence shells
* so they are already stable
* and do not react with any other atoms (are inert)
 | 1st point | 2 points correct.must have 1st point. |  |
| **e)** | i) sodium chlorideii) potassium hydroxideiii) hydrogen sulfide iv) copper sulfate v) silver nitrate | 3 correct | 5 correct |  |
| **f)** | e.g. | Name (given) | +ve ion | -ve ion | Formula | 9/15 | 12/15 | 15/15 |
| (i) |  | Mg2+ | O2- | MgO |
| (ii) |  | Al3+ | Cl- | AlCl3 |
| (iii) |  | Na+ | $$HCO\_{3}^{-}$$ | NaHCO3 |
| (iv) |  | Ca2+ | $$CO\_{3}^{2-}$$ | CaCO3 |
| (v) |  | Li+ | O2- | Li2O |
| **4a)** | P CC CC PP P | 6 correct |  |  |
| **b)** | Chem* new substance formed(join together / break apart), (colour change, gas given off, reactant disappears, energy in/out)
* very hard to undo
* atoms break apart and join together in a different order.

Phys* No new substance (change shape, state, dissolving)
* relativity easy to undo
* particles (not atoms) may break apart but jion back together in the same way (No new bonds form)
 | 1 point from each of chem and phys  | 4 points | 5+ gives example(s) |
| **5a)** | copper carbonate 🡪 carbon dioxide + copper oxide | Correct word equation |  |  |
| **b)** | zinc + hydrochloric acid 🡪 zinc chloride + hydrogenZn + 2HCl 🡪 ZnCl2 + H2 | Correct word equation | symbol equationallow H (for H2) | Correct balanced equation |
| **c)** | methane + oxygen 🡪 carbon dioxide + water | Correct word equation |  |  |

Only the highest grade for each question is awarded.

total questions =16

|  |  |  |  |
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| **Opportunities:** | **Achievement 16** | **Merit 11** | **Excellence 6** |
| **Sufficiency:**  | **9** | **6M + 5A** | **4E + 3M + 4A** |