# Year 12 Chemistry Self-Assessment Elemental Chemistry

### Formative Test 1

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| ***Expectation***  From SACE Subject Outline  *Note: these can be asked in converse* | ***Test Q*** | ***Proficiency***  (beginning/sometimes/proficient) | ***Comments/questions*** | ***Assignment question(s)*** |
| Write, using subshell notation, the electron configuration of an atom or monatomic ion of any of the first thirty-eight elements in the periodic table. | **1(a), 3(b)** |  |  | Assignment 1 Q1 |
| Identify the s, p, d, and f block elements in the periodic table. | **3(a)** |  |  | Assignment 1 Q2 |
| Predict the following properties of the s and p block elements of any of the first thirty-eight elements in the periodic table:   * metal, metalloid, or non-metal nature of the element * charge of the monatomic ions * likely oxidation number(s) of the element in its compounds (including octet expansion for phosphorus, sulfur, and chlorine). | **1(b),**  **(c)** |  |  | Assignment 1 Q3 (b) |
| Find regions in the periodic table with elements of high, intermediate, and low electronegativity. | **4(a)** |  |  | Assignment 1 Q3 (a) |
| Predict the acidic/basic character of the oxides of an element from the position of the element in the periodic table. | **3(c) (iii)** |  |  | Assignment 1 Q7 |
| Write equations for the reactions of oxides of non-metals such as SiO2, CO2, SO2, SO3, and P4O10 with hydroxide ions and with water, where a reaction occurs. | **-** |  |  | Assignment 1 Q5 |
| Write equations for the reactions of oxides of metals such as MgO, Na2O, CuO, and Fe2O3 with acids and with water, where a reaction occurs. | **-** |  |  | Assignment 1 Q4 |
| Write equations for the reactions of amphoteric oxides such as Al2O3 and ZnO with hydrogen ions or hydroxide ions. | **3(c) (ii)** |  |  | Assignment 1 Q6 |
| Predict whether or not a compound or element is likely to be molecular, given its properties, name, elemental composition, or formula. | **3(c) (i)** |  |  | Assignment 2 Q2 |
| Compare the strengths of covalent bonds with the strengths of secondary interactions. | **-** |  |  | Assignment 2 Q3 (e) |
| Explain the higher melting points and boiling points of substances of large molar mass. | **-** |  |  | Assignment 2 Q4 (c) |
| Draw diagrams showing covalent bonds, non‑bonding pairs, and shapes for three-element molecules and two-element ions containing no more than five atoms. Examples that involve valence shell octet expansion are limited to PO43- tetrahedra, SO2 , and SO3. | **1(c), 4(b)** |  |  | Assignment 2 Q5 |
| Predict whether or not a molecule is polar, given its spatial arrangement. | **4(c)** |  |  | Assignment 2 Q4 (b) |
| Explain the higher melting points and boiling points of polar substances compared with those of non-polar substances of similar molar mass. | **4(d)** |  |  | Assignment 2 Q7 (b) |
| Describe, with the aid of diagrams, hydrogen bonding between molecules. | **2(b)** |  |  | Assignment 2 Q7 (a) |