**Atoms, Elements, and Compounds: Chapters 1.2 - 3.3**

Circle physical or chemical change for the following questions. (8 marks)

|  |  |
| --- | --- |
| 1) bleaching your hair | Physical / Chemical |
| 2) melting butter for popcorn | Physical / Chemical |
| 3) separating sand from gravel | Physical / Chemical |
| 4) burning toast | Physical / Chemical |
| 5) mixing lemonade powder with water | Physical / Chemical |
| 6) recharging batteries | Physical / Chemical |
| 7) cream being whipped | Physical / Chemical |
| 8) water evaporating | Physical / Chemical |

Draw Bohr diagrams for the following (5 marks each):

9) Ne

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10) S2-

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11) Ca2+

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12) N

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Given two elements/polyatomic ions, write the proper chemical name and chemical formula for the following (4 marks each):

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| --- | --- | --- |
| Elements/Polyatomic ions | Chemical Name | Chemical Formula |
| 13) Beryllium + Selenium |  |  |
| 14) Tin (IV) + Bromine |  |  |
| 15) Scandium + Permanganate |  |  |
| 16) Sodium + Sulphate |  |  |
| 17) Aluminium + Hydrogen Carbonate |  |  |
| 18) Ammonium + Nitrate |  |  |
| 19) Nickel (III) + Dichromate |  |  |
| 20) Magnesium + Nitrogen |  |  |
| 21) Vanadium (V) + Carbonate |  |  |
| 22) Barium + Phosphite |  |  |

**Written Section**

23) Give two key differences between an ionic and a covalent compound (2 marks).

24) Imagine you were a chemist who first discovered Iodine, the element. Give three pieces of information about Iodine that you could use to reasonably fit Iodine in the existing periodic table. Justify your response (3 marks).

25) Why do noble gases never come with a charge? (1 mark)

26) Certain elements exist in isotopes, which means the same element may have different number of neutrons. Would changing the number of neutrons change your element? Change the charge of your element? Why or why not? (3 marks)

27) Rutherford shot alpha particles at a sheet of gold foil. These alpha particles are also known as a \_\_\_\_\_\_\_nucleus. (1 mark)

28) Can certain chemical changes be considered physical changes? Why or why not? (2 marks)

29) Hot air balloons use a heat source to heat the air underneath the balloon. Using the Kinetic Molecular Theory and properties of matter, explain why hot air balloons can rise above ground. (4 marks)

30) Explain the motion of particles as added heat causes your solid to turn into liquid and then gas. (5 marks)

31) Give an example of a pure substance undergoing a physical change. Is this an endothermic or exothermic change? Is it reversible or irreversible? Provide reasons for your response. (6 marks)