**­­Multiple Choice Questions**

**GCSE Chemistry – Chemical changes**

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| **INSTRUCTIONS Score: /20** |

* **Read the question carefully.**
* **Circle the correct letter.**
* **Answer all questions.**

|  |  |  |
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| 1. | The element lithium has the chemical symbol: | |
|  | a. | L |
|  | b. | LI |
|  | c. | Li |
|  | d. | Lu |
| 2. | Methane has one carbon atom and four hydrogen atoms, so the chemical formula is: | |
|  | a. | CH4 |
|  | b. | C4H |
|  | c. | CH |
|  | d. | C4H4 |
| 3. | The balanced symbol equation for sodium reacting with chlorine is: | |
|  | a. | 2Na + Cl2 →2NaCl2 |
|  | b. | Na + Cl2 →NaCl2 |
|  | c. | 2Na + Cl2 →NaCl2 |
|  | d. | 2Na + Cl2 →2NaCl |
| 4. | When oxygen reacts the half equation is: | |
|  | a. | O2 →2O2- + 2e- |
|  | b. | O2 →2O2- + 4e- |
|  | c. | O2 →O2- + 4e- |
|  | d. | O2 → O2- + 2e- |
| 5. | The chemical formula for magnesium chloride is, as the ions are Mg2+ and Cl-: | |
|  | a. | MgCl2 |
|  | b. | Mg2Cl |
|  | c. | MgCl |
|  | d. | Mg2Cl2 |
| 6. | The test for hydrogen gas is: | |
|  | a. | Limewater goes cloudy. |
|  | b. | Relights a glowing splint. |
|  | c. | Bleaches litmus paper. |
|  | d. | Squeaky pop test. |
| 7. | The test for carbon dioxide is: | |
|  | a. | Limewater goes cloudy. |
|  | b. | Relights a glowing splint. |
|  | c. | Bleaches litmus paper. |
|  | d. | Squeaky pop test. |
| 8. | Copper carbonate reacts with hydrochloric acid to produce: | |
|  | 1. Copper chloride and carbon dioxide. | |
|  | 1. Copper carbonate and carbon dioxide. | |
|  | 1. Copper chloride and hydrogen. | |
|  | 1. Copper carbonate and hydrogen. | |
|  |  | |
| 9. | Acids dissolve in water to produce: | |
|  | a. | OH- |
|  | b. | H+ |
|  | c. | H- |
|  | d. | OH+ |
|  |  | |
| 10. | Alkalis dissolve in water to produce: | |
|  | a. | OH- | |
|  | b. | H+ | |
|  | c. | H- | |
|  | d. | OH+ | |
|  |  |  | |
| 11. | The general neutralisation equation is: | |
|  | a. | Acid + Alkali → Salt + Hydrogen |
|  | b. | Acid + Alkali → Salt + Water |
|  | c. | Acid + Alkali → Hydroxide + Water |
|  | d. | Acid + Alkali → Hydroxide + Hydrogen |
|  |  | |
| 12. | The general ionic equation for neutralisation is: | |
|  | a. | H + OH →H2O |
|  | b. | H- + OH- →H2O |
|  | c. | H+ + OH- →H2O |
|  | d. | H+ + OH- →2H2O |
|  |  | |
| 13. | When a metal reacts it forms: | |
|  | a. | A positive ion. |
|  | b. | An atom. |
|  | c. | A negative ion. |
|  | d. | A covalent bond. |
|  |  | |
| 14. | A concentrated solution of acid contains: | |
|  | a. | Fully ionised hydrogen ions. |
|  | b. | Partially ionised ions. |
|  | c. | Fully ionised hydroxide ions. |
|  | d. | Partially ionised hydroxide ions. |
|  |  | |
| 15. | When molten lead bromide undergoes electrolysis the products are: | |
|  | a. | Lead and bromide. |
|  | b. | Lead and oxygen. |
|  | c. | Lead and bromine. |
|  | d. | Lead and water. |
|  |  | |
| 16. | Reduction reactions are: | |
|  | a. | The losing of electrons. |
|  | b. | The gaining of oxygen. |
|  | c. | The gaining of electrons. |
|  | d. | The losing of ions. |
|  |  | |
| 17. | The opposite reaction of reduction is: | |
|  | a. | Oxidation. |
|  | b. | Oxygenation. |
|  | c. | Gaining. |
|  | d. | neutralisation. |
|  |  | |
| 18. | In Fe2O3 the iron is: | |
|  | a. | Oxidised. |
|  | b. | Reduced. |
|  | c. | Neutralised. |
|  | d. | Combusted. |
|  |  | |
| 19. | During electrolysis, non-metals go to the: | |
|  | a. | Cathode. |
|  | b. | Electrolyte. |
|  | c. | Solution. |
|  | d. | Anode. |
|  |  | |
| 20. | Non-metals go to this electrode as they are: | |
|  | a. | Positively charged. |
|  | b. | Neutral. |
|  | c. | Negatively charged. |
|  | d. | Larger. |
|  |  | |

**Multiple Choice Questions**

**GCSE Physics – Atomic structure**

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| **INSTRUCTIONS Score: /20** |

* **Read the question carefully.**
* **Circle the correct letter.**
* **Answer all questions.**

|  |  |  |
| --- | --- | --- |
| 1. | A radioactive substance contains… | |
|  | a. | unstable electrons that become stable by emitting radiation. |
|  | b. | unstable atoms that become stable by emitting radiation. |
|  | c. | unstable protons that become stable by emitting radiation. |
|  | d. | unstable nuclei that become stable by emitting radiation. |
| 2. | Rutherford used what kind of particles to conduct his particle scattering experiment? | |
|  | a. | α |
|  | b. | β |
|  | c. | γ |
|  | d. | λ |
| 3. | Which ONE of the following statements was NOT a result from Rutherford’s experiment? | |
|  | a. | Most of the particles passed straight through the gold foil. |
|  | b. | Most of the particles reduced speed significantly as they passed through the gold foil. |
|  | c. | Some of the particles were deflected back through large angles. |
|  | d. | A very small number of particles were deflected backwards. |
| 4. | Isotopes are atoms of the same element with… | |
|  | a. | the same number of protons, different numbers of neutrons. |
|  | b. | different numbers of protons, the same number of neutrons. |
|  | c. | different numbers of protons and neutrons. |
|  | d. | the same number of protons, different numbers of electrons. |
| 5. | Which equation represents the decay of potassium to calcium by emitting a beta particle? | |
|  | a. |  |
|  | b. |  |
|  | c. |  |
|  | d. |  |
| 6. | When using a Geiger counter to measure radiation, you must also consider what? | |
|  | a. | Contamination radiation |
|  | b. | CMBR |
|  | c. | Incidental radiation |
|  | d. | Background radiation |

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| --- | --- | --- |
| 7. | The radiation from a radioactive substance can knock electrons out of an atom. This process is called… | |
|  | a. | extraction. |
|  | b. | ionisation. |
|  | c. | irradiation. |
|  | d. | penetration. |
| 8. | Smoke alarms contain which radioactive source? | |
|  | 1. Alpha | |
|  | 1. Beta | |
|  | 1. Gamma | |
|  | 1. None of these | |
|  |  | |
| 9. | The half-life of a radioactive isotope is the average time it takes for the number of… | |
|  | a. | neutrons in the radioactive sample to halve. |
|  | b. | atoms in the radioactive sample to halve. |
|  | c. | radioactive nuclei in the sample to halve. |
|  | d. | electrons in the radioactive sample to halve. |
|  |  | |
| 10. | A sealed tube containing 8 mg of a radioactive isotope has a half-life of 10 hours. Calculate what mass of the isotope is in the tube after 30 hours. | |
|  | a. | 6 mg | |
|  | b. | 4 mg | |
|  | c. | 0.5 mg | |
|  | d. | 1 mg | |
|  |  |  | |
| 11. | Which ONE of these medical applications can radioactive isotopes NOT be used for? | |
|  | a. | The breakdown of kidney stones. |
|  | b. | Medical imaging. |
|  | c. | Treatment of cancer. |
|  | d. | Tracers to monitor organs. |
|  |  | |
| 12. | Nuclear fission is… | |
|  | a. | the joining of an atom’s nucleus into two smaller nuclei, two or three neutrons and the release of energy. |
|  | b. | the splitting of an atom’s nucleus into two smaller nuclei, two or three neutrons and the release of energy. |
|  | c. | the splitting of an atom into two smaller atoms, two or three neutrons and the release of energy. |
|  | d. | the splitting of an atom’s nucleus into two smaller nuclei, two or three protons and the release of energy. |
|  |  | |
| 13. | The fuel in a nuclear reactor must contain isotopes capable of undergoing nuclear fission. The most common type of fuel used is… | |
|  | a. | Uranuim-238. |
|  | b. | Uranuim-235. |
|  | c. | Plutonium-239. |
|  | d. | Thorium-232. |
|  |  | |

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| --- | --- | --- |
| 14. | When nuclear fission occurs, several neutrons can be released which can cause other fissionable isotopes to split. This is called… | |
|  | a. | a spontaneous reaction. |
|  | b. | a fission reaction. |
|  | c. | an uncontrollable reaction. |
|  | d. | a chain reaction. |
|  |  | |
| 15. | The reaction described in question 14 can be prevented in a nuclear reactor core by using… | |
|  | a. | lead shielding. |
|  | b. | control rods. |
|  | c. | a moderator. |
|  | d. | coolant. |
|  |  | |
| 16. | Fusion reactions take place when… | |
|  | a. | two small nuclei are fused together and release energy. |
|  | b. | two small atoms are fused together and release energy. |
|  | c. | two large nuclei are fused together and release energy. |
|  | d. | two small nuclei are fused together and release neutrons. |
|  |  | |
| 17. | Which ONE of the following would NOT be an advantage of a fusion reactor? | |
|  | a. | Heavy hydrogen fuel is easily available in sea water. |
|  | b. | The reaction product, helium, is a non-radioactive gas. |
|  | c. | The energy released could be used to generate electricity. |
|  | d. | Fusion reactors have a short start up time. |
|  |  | |
| 18. | An alpha emitting isotope that seeps into houses through the ground in some areas is called… | |
|  | a. | uranium gas. |
|  | b. | radon gas. |
|  | c. | thorium gas. |
|  | d. | plutonium gas. |
|  |  | |
| 19. | Nuclear waste must be stored securely for many years. The radiation it emits is dangerous because… | |
|  | a. | it ionises the air we breathe. |
|  | b. | it will irradiate the soil. |
|  | c. | it can cause cancer. |
|  | d. | it will start a chain reaction. |
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| 20. | Radiation can be found naturally in the environment. The most common source of this radiation is from… | |
|  | a. | radon gas. |
|  | b. | rocks. |
|  | c. | cosmic rays |
|  | d. | plants. |
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