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| **WASHINGTON LATIN PUBLIC CHARTER SCHOOL**  **CHEMISTRY 2019-20**  **UNIT 5B TEST - CHEMICAL REACTIONS II: REDOX REACTIONS**  Answer all questions  Recommended time = 30 minutes  You must have a Periodic Table and a copy of the reactivity series.  حظا طيبا وفقك الله   |  |  |  |  | | --- | --- | --- | --- | |  | Name: |  |  | |  | Score (open response) | /20 |  | |  | Score (multiple choice) | /5 |  | |  | Bonus (Submits quiz on time and in correct format) | /25 |  | |  | Total: | /50 |  | |

**SECTION 1 - OPEN RESPONSE**

Fill in all green cells

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **1.** | The elements in Group 2 are known as the “alkali earth metals”.  Calcium and magnesium are very abundant but the others are not.  Nina dropped a small piece of magnesium metal into a beaker of hydrochloric acid (HCl)  She then dropped a small piece of calcium metal into another beaker of hydrochloric acid. | | | |  |
| (a) | Explain what she would **observe** when she dropped the magnesium into the acid. | | | 2 |
|  |  | | |  |
| (b) | Write an equation for the reaction taking place. | | | 2 |
|  |  | | |  |
| (c) | Identify the atom oxidised and the atom reduced in this reaction. | | | 2 |
|  | Atom oxidised:  Atom reduced: | | |  |
| (d) | Will the reaction between calcium and hydrochloric acid be faster or slower than the reaction between magnesium and hydrochloric acid? Explain your answer. | | | 3 |
|  |  | | |  |
| TOTAL | | | | 9 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **2.** | Sophia set up a galvanic cell. On one side she immersed an iron (Fe) electrode into a solution of iron chloride (FeCl2). On the other side she immersed a zinc (Zn) electrode into a solution of zinc chloride (ZnCl2).  She connects the electrodes with a wire and a light bulb. She connects the solutions with a salt bridge. When she does this the light comes on, but after a while she notices that the light gradually becomes dimmer. | | | |  |
| (a) | Write an equation for the overall cell reaction taking place in this cell | | | 2 |
|  |  | | |
| (b) | Identify the positive electrode and the negative electrode. | | | 2 |
| positive electrode: | |  |
| negative electrode: | |  |
| (c) | Explain why the bulb lights up. | | | 2 |
|  |  | | |
| (d) | As the light starts to dim, Sophia notices that the electrodes look a bit different to how they originally did.  State one change she would observe in the appearance of the electrodes. Explain your answer. | | | 2 |
|  |  | | |
| TOTAL | | | | 8 |

|  |  |  |  |
| --- | --- | --- | --- |
| **3.** | Chris decided to electrolyse an aqueous solution of copper sulfate. | |  |
| (a) | Name the element produced at the cathode during this electrolysis. |  |
|  |  |
| (b) | Name the element produced at the anode during this electrolysis |  |
|  |  |
| (c) | Which of the above elements is produced as a result of reduction? |  |
|  |  |  |
| TOTAL | | 3 |

**SECTION 2 - MULTIPLE CHOICE**

**Do not answer these questions on this sheet**

**Make a note of your answers and enter them in the answer sheet.**

|  |  |  |
| --- | --- | --- |
| **4.** | Which of the following will not happen when a piece of copper metal is dropped into a solution of silver nitrate? | |
|  | **A** | A grey solid will appear. |
|  | **B** | The silver will be oxidized. |
|  | **C** | The copper will gradually dissolve and turn the solution blue. |
|  | **D** | The concentration of silver ions in the solution will decrease. |
| 1 | | |

|  |  |  |
| --- | --- | --- |
| **5.** | Which of the following is not true of electrolytic cells? | |
|  | **A** | Oxidation takes place at the anode. |
|  | **B** | Reduction takes place at the cathode. |
|  | **C** | The anode is the positive electrode. |
|  | **D** | Chemical energy is converted into electrical energy. |
| 1 | | |

|  |  |  |
| --- | --- | --- |
| **6.** | Which of the following statements about lithium-ion batteries is untrue? | |
|  | **A** | They are low-density, compact and easily portable. |
|  | **B** | They are cheap. |
|  | **C** | They can be easily recharged. |
|  | **D** | They are used in almost all cellphones. |
| 1 | | |

|  |  |  |
| --- | --- | --- |
| **7.** | Which of the following statements about the electrolysis of molten aluminium oxide is untrue? | |
|  | **A** | Aluminium will form at the cathode. |
|  | **B** | The process uses a lot of energy. |
|  | **C** | Oxygen will form at the anode. |
|  | **D** | There are cheaper ways to make aluminium. |
| 1 | | |

|  |  |  |
| --- | --- | --- |
| **8.** | What will be the electrode products when a concentrated aqueous solution of sodium chloride (brine) is electrolysed? | |
|  | **A** | Sodium at the cathode, chlorine at the anode. |
|  | **B** | Sodium at the cathode, oxygen at the anode. |
|  | **C** | Hydrogen at the cathode, chlorine at the anode. |
|  | **D** | Hydrogen at the cathode, oxygen at the anode. |
| 1 | | |

**End of Test**

[**click here to go straight to the answer sheet and exit ticket**](https://docs.google.com/forms/d/e/1FAIpQLScrgXoygmbgZlf_oZoECfqjMYEDtIHH88BEJOvimoytmmT2Kg/viewform?usp=sf_link)