**Questions on Oxidation-Reduction Reactions**



**Instructions:** For the following questions, show your work to support your answers. Answers are provided in a separate document.

1. Give the oxidation number for each of the following species. For the compounds, give the oxidation number of the underlined element.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| O2 | O22- | PCl5 | HNO2 | Na2SO4 | N2O3 |

1. Assign oxidation number to each atom in the following compounds.

|  |  |  |  |
| --- | --- | --- | --- |
| CdS | AlH3 | S2O32– | Na2Cr2O7 |

1. Chlorine can have several different oxidation numbers ranging in value from –1 to +7.

Write the formula and give the name of the *chlorine oxide compound* in which chlorine has an oxidation number of +2, +3, +6, and +7.

Example: *+2 = ClO (because O = -2) chlorine monoxide*

1. For the following reaction:
   1. Assign oxidation numbers to all atoms.
   2. Determine which substance is undergoing oxidation and which reduction.
   3. Identify the oxidizing and reducing agents.

Ca(*s*) + 2 H+(*aq*) → Ca2+ (*aq*) + H2(*g*)

1. In the following reaction, determine if chlorine (Cl2) is oxidized or reduced? Support your choice by showing your work. 2Rb(*s*) + Cl2(*g*) → 2 RbCl(*s*)

1. What is the change in the oxidation number for iron (Fe) in the following reaction? Is it the oxidizing agent or the reducing agent?

2Fe2O3(*s*) + 3 C(*s*) → 4 Fe(*s*) + 3 CO2(*g*)

1. In the following oxidation-reduction reaction, which species functions as the reducing agent?

P(*s*) + 3 Br2(*l*) → 2 PBr3(*l*

1. Determine if each of the following reactions is a redox reaction. If it is a redox, then identify the oxidizing and reducing agents.
2. HgCl2(*aq*) + 2KI(*aq*) → HgI2(*s*) + 2KCl(*aq*)
3. Fe2O3(*s*) + 3CO(*g*) → 2Fe(*s*) + 3CO2(*g*)
4. PCl3(*l*) + 3H2O(*l*) → 3HCl (*aq*) + H3PO3(*aq*)
5. 4NH3(*g*) + 3O2(*g*) → 2N2(*g*) + 6H2O(*g*)