Electrochemistry

Name		
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Block: \_\_\_\_\_

Date: \_\_\_\_\_

## Chemistry 12

## **BALANCING REDOX HALF-REACTIONS**

Balance each of the following half-cell reactions in ACIDIC solution. Also, state whether the reaction is oxidation or reduction.

1.

- $S_2O_3^{2-}$
- $\rightarrow$
- SO<sub>4</sub><sup>2-</sup>

2.

- $MnO_4$
- $\rightarrow$
- $Mn^{2+}$

3.

- As
- $\rightarrow$
- $AsO_4^{3-}$

4.

- $Cr^{3+}$
- $\rightarrow$
- $Cr_2O_7^{2-}$

5.

- $Pb^{2+}$
- $\rightarrow$
- PbO<sub>2</sub>

6.

- $SO_4^{2-}$
- $\rightarrow$
- S

7.

- $NO_3$
- $\rightarrow$
- NO

8.

- $NO_3^-$
- $\rightarrow$
- $NH_4^+$

9.

- $BrO_3$
- $\rightarrow$
- $Br_2$

Balance each of the following half-cell reactions in BASIC solution.

10.

- $NO_3$
- $\rightarrow$
- NO

11.

- $MnO_4$
- $\rightarrow$
- $Mn^{2+}$

12.

- As
- $\rightarrow$
- $AsO_4^{3-}$

13.

 $Cr^{3+}$ 

 $\rightarrow$ 

 $Cr_2O_7^{2-}$ 

14.

 $Pb^{2+}$ 

 $\rightarrow$ 

PbO<sub>2</sub>

15.

 $SO_4^{2-}$ 

 $\rightarrow$ 

S

16.

 $S_2O_3^{2-} \rightarrow$ 

 $SO_4^{2-}$ 

17.

 $NO_3$ 

 $\rightarrow$ 

 $NH_4^+$ 

18.

 $BrO_3$ 

 $\rightarrow$ 

 $Br_2$ 

19. Determine if each of the following changes is oxidation, reduction or neither.

 $SO_3^{2-}$ 

 $\rightarrow$ 

 $SO_4^{2-}$ 

CaO

 $\rightarrow$ 

Ca

 $\text{CrO}_4^{2-}$ CrO<sub>4</sub><sup>2-</sup>

 $\rightarrow$  $\rightarrow$   $Cr_2O_7^{2-}$  $Cr^{3+}$ 

 $2I^{-}$ 

 $\rightarrow$ 

 $I_2$ 

 $IO_3$ 

 $\rightarrow$ 

 $I_2$  $Mn^{2+}$ 

 $MnO_4$  $ClO_2$ 

 $\rightarrow$  $\rightarrow$ 

ClO

20.

 $Cr_2O_7^{2-}$ 

 $Fe^{2+}$ 

 $Cr^{3+}$ 

Fe<sup>3+</sup>

Substance reduced

Substance oxidized

Oxidizing agent

Reducing agent