

1. Identify the oxidizing agent in  
 $\text{Al} + \text{H}^+ \rightarrow \text{Al}^{3+} + \text{H}_2$ .

[1] \_\_\_\_\_

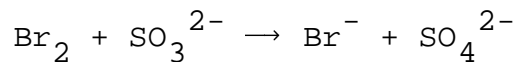
2. Identify the reducing agent in  
 $\text{H}_2\text{SO}_4 + \text{MnO}_2 \rightarrow \text{SO}_4^{2-} + \text{Mn}^{2+}$ .

[2] \_\_\_\_\_

3. Find the oxidation number of the underlined atom in  
a)  $\text{H}_2\underline{\text{S}}$ .  
b)  $\underline{\text{I}}\text{O}_4^-$ .

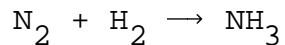
[3] \_\_\_\_\_

4. Is the following an oxidation-reduction reaction? If yes, name the element reduced.



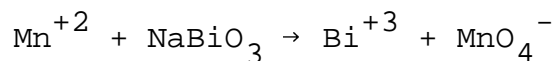
[4] \_\_\_\_\_

5. Is the following an oxidation-reduction reaction? If yes, name the element oxidized.



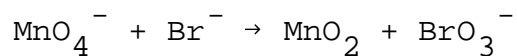
[5] \_\_\_\_\_

6. Balance the following oxidation-reduction reaction in acidic solution. How many  $\text{H}_2\text{O}$  molecules are needed?



[6] \_\_\_\_\_

7. Balance the following oxidation-reduction reaction in basic solution. How many  $\text{H}_2\text{O}$  molecules are there?



[7] \_\_\_\_\_

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Key Sheet

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[1]  $\text{H}^+$

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[2]  $\text{H}_2\text{SO}_3$

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[3] a)  $2^-$   
b)  $7^+$

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[4] Yes, Br

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[5] Yes, H

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[6]  $7 \text{H}_2\text{O}$

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Key Sheet

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[7] 1 H<sub>2</sub>O