

Name \_\_\_\_\_ Period \_\_\_\_\_

College Prep Chemistry of the Earth

Assignment 6H – Triple Stoichiometry Conversions (Part 2)

20 Points

For the following chemical reactions, complete the chart and perform the following conversions

|                   |   |                      |   |                                  |   |                              |   |                                 |
|-------------------|---|----------------------|---|----------------------------------|---|------------------------------|---|---------------------------------|
| Chemical Equation | $6\text{ZnBrO}_3 + \text{Cr}_2(\text{CO}_3)_3 \rightarrow 3\text{Zn}_2\text{CO}_3 + 2\text{Cr}(\text{BrO}_3)_3$ |                      |   |                                  |   |                              |   |                                 |
| Molar Ratio       | 6   | mol $\text{ZnBrO}_3$ | 1 | mol $\text{Cr}_2(\text{CO}_3)_3$ | 3 | mol $\text{Zn}_2\text{CO}_3$ | 2 | mol $\text{Cr}(\text{BrO}_3)_3$ |

|                                 |             |
|---------------------------------|-------------|
| MM $\text{ZnBrO}_3$             | 193.29g/mol |
| MM $\text{Cr}_2(\text{CO}_3)_3$ | 284.03g/mol |

|                                |             |
|--------------------------------|-------------|
| MM $\text{Zn}_2\text{CO}_3$    | 190.79g/mol |
| MM $\text{Cr}(\text{BrO}_3)_3$ | 435.70g/mol |

① Convert 469.622g  $\text{ZnBrO}_3$  to mol  $\text{ZnBrO}_3$

|                           |                           |
|---------------------------|---------------------------|
| 469.622g $\text{ZnBrO}_3$ | 1 mol $\text{ZnBrO}_3$    |
|                           | 193.29g $\text{ZnBrO}_3$  |
| mol $\text{ZnBrO}_3 =$    | 2.43 mol $\text{ZnBrO}_3$ |

② Convert mol  $\text{ZnBrO}_3$  to mol  $\text{Zn}_2\text{CO}_3$

|                                |                                   |
|--------------------------------|-----------------------------------|
| 2.43 mol $\text{ZnBrO}_3$      | 3 mol $\text{Zn}_2\text{CO}_3$    |
|                                | 6 mol $\text{ZnBrO}_3$            |
| mol $\text{Zn}_2\text{CO}_3 =$ | 1.22 mol $\text{Zn}_2\text{CO}_3$ |

Mol Ratio  
3:6

③ Convert mol  $\text{Zn}_2\text{CO}_3$  to mass  $\text{Zn}_2\text{CO}_3$

|                                   |                                   |
|-----------------------------------|-----------------------------------|
| 1.22 mol $\text{Zn}_2\text{CO}_3$ | 190.79g $\text{Zn}_2\text{CO}_3$  |
|                                   | 1 mol $\text{Zn}_2\text{CO}_3$    |
| mass $\text{Zn}_2\text{CO}_3 =$   | 232.76 g $\text{Zn}_2\text{CO}_3$ |

1 → 2

2 → 3

mass = g (mm)

Volume = L (Molar Volume)

Molar Mass Ratio  
193.29 g/mol  
193.29g = 1 mol

Convert 875.63g  $\text{Cr}_2(\text{CO}_3)_3$  to mol  $\text{Cr}_2(\text{CO}_3)_3$

|                                    |  |
|------------------------------------|--|
|                                    |  |
|                                    |  |
| mol $\text{Cr}_2(\text{CO}_3)_3 =$ |  |

Convert mol  $\text{Cr}_2(\text{CO}_3)_3$  to mol  $\text{Cr}(\text{BrO}_3)_3$

|                                   |  |
|-----------------------------------|--|
|                                   |  |
|                                   |  |
| mol $\text{Cr}(\text{BrO}_3)_3 =$ |  |

Convert mol  $\text{Cr}(\text{BrO}_3)_3$  to mass  $\text{Cr}(\text{BrO}_3)_3$

|                                    |  |
|------------------------------------|--|
|                                    |  |
|                                    |  |
| mass $\text{Cr}(\text{BrO}_3)_3 =$ |  |

|                   |   |  |  |  |  |  |  |
|-------------------|---|--|--|--|--|--|--|
| Chemical Equation | $2\text{VPO}_4 + 3\text{Li}_2\text{S}_2\text{O}_3 \rightarrow \text{V}_2(\text{S}_2\text{O}_3)_3 + 2\text{Li}_3\text{PO}_4$ |  |  |  |  |  |  |
| Molar Ratio       |   |  |  |  |  |  |  |

|                                      |             |
|--------------------------------------|-------------|
| MM $\text{VPO}_4$                    | 145.91g/mol |
| MM $\text{Li}_2\text{S}_2\text{O}_3$ | 126.02g/mol |

|   |             |
|---|-------------|
| MM $\text{V}_2(\text{S}_2\text{O}_3)_3$ | 438.30g/mol |
| MM $\text{Li}_3\text{PO}_4$             | 115.79g/mol |

|   |  |
|---|--|
| Convert 469.622g $\text{VPO}_4$ to mol $\text{VPO}_4$ |  |
|   |  |
|   |  |
| mol $\text{VPO}_4 =$                                  |  |

|  |  |
|--|--|
| Convert mol $\text{VPO}_4$ to mol $\text{V}_2(\text{S}_2\text{O}_3)_3$ |  |
|  |  |
|  |  |
| mol $\text{V}_2(\text{S}_2\text{O}_3)_3 =$                             |  |

|   |  |
|---|--|
| Convert mol $\text{V}_2(\text{S}_2\text{O}_3)_3$ to mass $\text{V}_2(\text{S}_2\text{O}_3)_3$ |  |
|   |  |
|   |  |
| mass $\text{V}_2(\text{S}_2\text{O}_3)_3 =$   |  |

|  |  |
|--|--|
| Convert 563.84g $\text{Li}_2\text{S}_2\text{O}_3$ to mol $\text{Li}_2\text{S}_2\text{O}_3$ |  |
|  |  |
|  |  |
| mol $\text{Li}_2\text{S}_2\text{O}_3 =$  |  |

|   |  |
|---|--|
| Convert mol $\text{Li}_2\text{S}_2\text{O}_3$ to mol $\text{Li}_3\text{PO}_4$ |  |
|   |  |
|   |  |
| mol $\text{Li}_3\text{PO}_4 =$  |  |

|   |  |
|---|--|
| Convert mol $\text{Li}_3\text{PO}_4$ to mass $\text{Li}_3\text{PO}_4$ |  |
|   |  |
|   |  |
| mass $\text{Li}_3\text{PO}_4 =$                                       |  |