Answer on Question #76086, Chemistry / General Chemistry

How many mL of 0.660 M HBr are needed to dissolve 5.61 g of MgCO3?

Solution

$2HBr + MgCO_3 = MgBr_2 + H_2O + CO_2$

1. Find amount of chemical substance of $MgCO_3$:

    n = m/M;

    $M(MgCO_3)$ = 24.31+ 12.01+ 16.00·3 = 84.32 (g/mol);

    n $(MgCO_3)$ = 5.61/84.32 = 0.067 (mol).

2. Find amount of chemical substance of HBr:

    According to equation 2 mol of HBr react with 1 mole of $MgCO_3$;

    We have x mol of HBr that react with 0.067 mol of $MgCO_3$;

    2/x = 1/0.067;

    x= 0.134;

    n(HBr) = 0.134 mol.

3. Find volume (mL) of 0.660 M HBr:

    1000 mL of solution contains 0.660 mol of HBr,

    y mL of solution contains 0.134 mol of HBr;

    1000/y = 0.660/0.134;

    y = 203.03;

    V = 203.03 mL.

Answer: 203.03 mL