Answer on Question #82463, Chemistry / General Chemistry

1. What volume (in mL) of a 0.164M solution of $Ca(OH)_2$ should be used to neutralize 22.4 mL of a 0.369M solution in H_3PO_4.

Solution:

$C_M = \frac{n}{V}$

$V(H_3PO_4) = 22.4mL = 0.0224\ L$

$n = C_M \times V$

$n\ (H_3PO_4) = 0.0224 \times 0.369 = 0.00826\ mol$

$3Ca(OH)_2 + 2H_3PO_4 = Ca_3(PO_4)_2 + 6H_2O$

$n(Ca(OH)_2) : n(H_3PO_4) = 3:2 = 1.5 : 1$

$n(Ca(OH)_2) = 1.5 \times 0.00826\ mol = 0.012\ mol$

$C_M\ (Ca(OH)_2) = 0.164\ mol/L$

On 1L – 0.164 mol

On XL - 0.012 mol

$X = 0.073L = 73\ mL$

Answer: $V(Ca(OH)_2) = 73\ mL$