

## Answer on Question #63721 - Chemistry – Inorganic Chemistry

How do you make a liquid 8% solution by volume of  $\text{NaHCO}_3$  from dry  $\text{NaHCO}_3$  that is 45% by weight?

### **Solution.**

Weight percent = 45%

45 g  $\text{NaHCO}_3$  in 100 g solution

$\rho(\text{solution}) = 1.0581 \text{ g/mL}$

$V(\text{solution}) = m(\text{solution})/\rho(\text{solution}) = 100/1.0581 = 94.5 \text{ mL}$

$\rho(\text{NaHCO}_3) = 2.2 \text{ g/mL}$

$V(\text{NaHCO}_3) = m(\text{NaHCO}_3)/\rho(\text{NaHCO}_3) = 45/2.2 = 20.45 \text{ mL}$

Volume percent =  $(20.45/94.5) \times 100\% = 21.64\%$

$8\% = (20.45/x) \times 100\%$

$x = 255.6 \text{ mL solution}$

$m(\text{H}_2\text{O}) = 255.6 - 100 = 155.6 \text{ mL}$

**Answer:** Add to 45% solution of  $\text{NaHCO}_3$  155.6 mL of  $\text{H}_2\text{O}$

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