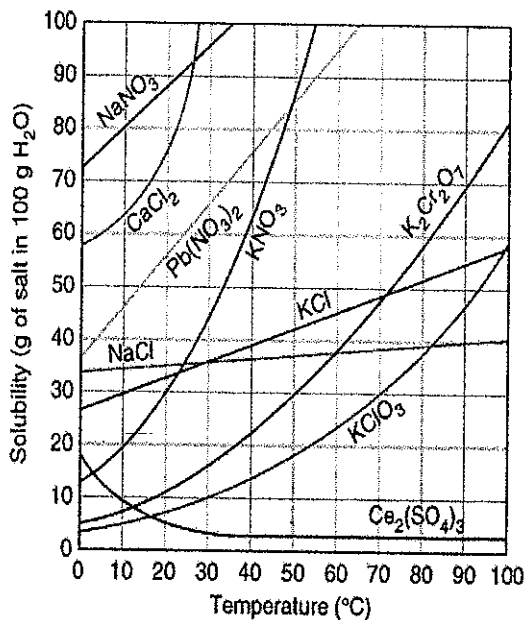


Name Key

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Use the provided solubility curve to answer the following questions.



For questions 1–4, an amount of solute is given and a temperature is stated. If all of the solute is dissolved in 100 g of water at the given temperature, would the resulting solution be unsaturated, saturated, or supersaturated?

1. 60 g KCl at 70°C Supersaturated
2. 10 g KClO_3 at 60°C unsaturated
3. 80 g NaNO_3 at 10°C saturated
4. 70 g CaCl_2 at 20°C unsaturated

For questions 5–8, a solute and a temperature are given. State how many grams of each solute must be added to 100 g of water to form a saturated solution at the given temperature.

5. $\text{Pb}(\text{NO}_3)_2$ at 10°C 46 g
6. $\text{Ce}_2(\text{SO}_4)_3$ at 50°C 2 g
7. NaCl at 20°C 35 g
8. $\text{K}_2\text{Cr}_2\text{O}_7$ at 50°C 30 g

For questions 9 and 10, underline the solution that has the higher concentration.

9. At 10°C : a saturated solution of KNO_3 or a saturated solution of CaCl_2 .
10. At 50°C : a saturated solution of KNO_3 or an unsaturated solution of NaNO_3 consisting of 90 g of the solute dissolved in 100 g of water.

For questions 11–16, show your work and circle your final answer.

11. If 115 g KNO_3 are added to 100 g of water at 35°C , how many grams do not dissolve?

$$115 \text{ g} - 54 \text{ g} = \boxed{61 \text{ g}}$$

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Name _____

12. What mass of KCl would be needed to form a saturated solution if the KCl was dissolved in 200 g of water at $80^{\circ}C$?

$$2(52) = \boxed{104 \text{ g}}$$

13. How many grams of solute are needed to prepare 500 g of 3.5% by mass Na_2CO_3 in water?

$$3.5 = \frac{x}{500} \cdot 100$$

$$x = \boxed{17.5 \text{ g}}$$

14. A 500 mL sample of 5.0% ethanol by volume contains how many mL of pure ethanol?

$$5.0 = \frac{x}{500} \cdot 100$$

$$x = \boxed{25 \text{ mL}}$$

15. What is the molarity of 320 g of glucose ($C_6H_{12}O_6$) in a 500 mL solution?

$$\text{molar mass} = 180.18 \text{ g}$$

$$\frac{320}{180.18} = 1.78 \text{ mol} \text{ (1)}$$

$$\frac{1.78 \text{ mol}}{0.5 \text{ L}} = \boxed{3.56 \text{ M}} \text{ (1)}$$

16. A saltwater solution contains 3.0 mol/kg of sodium chloride ($NaCl$). What mass of sodium chloride would 250 g of this solution contain?

$$3.0 = \frac{x}{0.25}$$

$$x = 0.75 \text{ mol} \text{ (1)}$$

$$0.75 \text{ mol} \times 58.44 \text{ g/mol} = \boxed{43.83 \text{ g}} \text{ (1)}$$

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