Appendix: Using Solubility Curves

The solubility curve is a lot of amount of a substance that will dissolve in 100 grams of water at increasing temperatures. Several compounds are typically shown on the same graph

To find solubility at a certain temperature;
Find the curve for the needed compound
Find the intersect on that curve for the required temperature.
Move to the y axis for the amount dissolved at that temperature

Example: KNO_3
What is solubility of KNO3 at 50 $^\circ$C?
  Find the KNO_3 curve
  Find 50 $^\circ$C on x- axis
  Move up the graph to find the 50°C intercept for this compound
  From the intercept point, move to the y-axis to read the amount that will dissolve
  For this example:
  At 50 $^\circ$C, KNO_3 intercept is 80 grams, so 80 grams will dissolve in 100 grams of water

The curve defines maximum amount (saturation) that will dissolve
Any amount added below this curve will dissolve and the solution is unsaturated
Any amount added above the saturation line will not dissolve

Example
Add 50 grams of NaCl to 100 grams of water at 80 $^\circ$C
  At this temperature, 40 grams is the most that will dissolve
  So, 50 g added, will dissolve 40 g and (50-40)g =10 g will not dissolve

The chart shows how much will dissolve in100 g, but dimensional analysis will give all solutions
Example: How much NaCl will dissolve in 500 grams of water at 80°C?

$$\frac{40 \text{ g NaCl}}{100 \text{ g H}_2\text{O}} \times 500 \text{ g H}_2\text{O} = 200 \text{ g NaCl}$$