Solubility · Maximum amount of solute that dissolves in a certain amount of solvent

$$S = \frac{g\,solute}{100\,g\,H_2O} \xrightarrow{dilute} = \frac{g\,solute}{100\,mL\,H_2O}$$

@40C
S=40g/100g

S_{KCl} (g/100g)

S=34g/100g H₂O
T=20

T (°C)
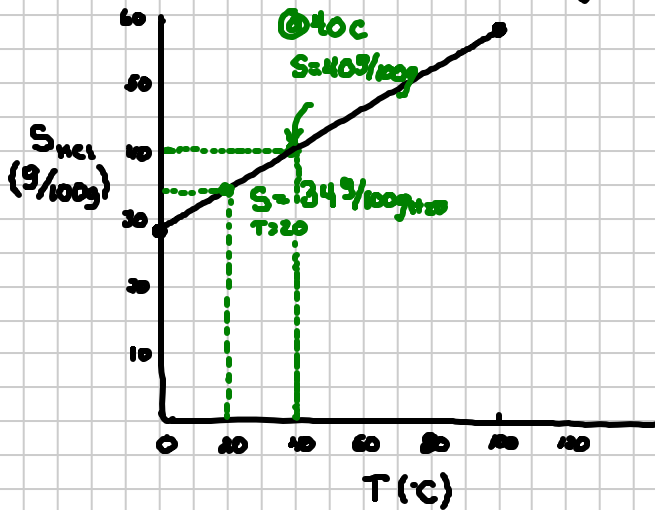
$$KCl: \quad S_{KCl} = \frac{28\,g\,KCl}{100\,g\,H_2O} \qquad S_{KCl} = \frac{58\,g\,KCl}{100\,g\,H_2O}$$
$$T=0°C \qquad\qquad T=100°C$$

✓• Will 40.0g KCl dissolve in 100g of H₂O at 20°C?
NO. 34g will dissolve.
6g solid ppt

• At what temp will all 40.0g dissolve?
@40°C, S= 40g KCl/100g H₂O

All 40g will dissolve

Saturated Solution: max amount of solute dissolved.

30°C
S=38g/100g

Supersaturation too much solute dissolved

ppt extra solute

S_{KCl} (g/100g)

Excess Solute ppt

saturated solution

S=58g/100g H₂O

Unsaturated soln. more solute can dissolve

T (°C)
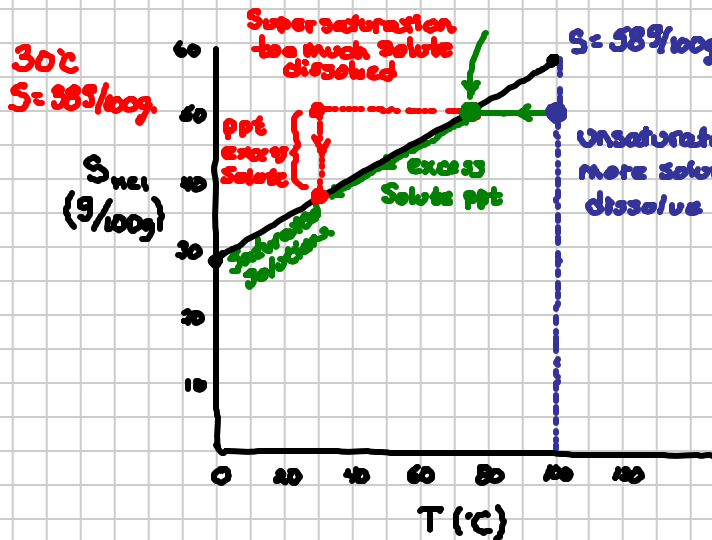
• Will 50.0g of KCl dissolve in 100g of H₂O? at 100°C?

Yes. 50g will dissolve with room for 8g more KCl.