

Experiment: To determine the Solubility of a Salt in water at Room Temperature

Definition:

solute:

solvent:

solution:

solubility in water (since the density of water is 1.00 g cm^{-3} under ordinary conditions):

Rate of dissolving can be increased by _____, however these techniques will _____ affect the final amount of solute that ultimately dissolves.

Safety: some of the salts used in this experiment may be toxic, wash your hands after use.

Apparatus and Materials

50 cm³ Burette, conical flask fitted with stopper, thermometer, stirrer, salt for solubility determination.

Procedure

1. Record all data and observations directly on this sheet
2. Mass a 250 mL conical flask.
3. Mass ~ 5 g of the salt, provided to you by your teacher, and place it in a conical flask, and record the mass.
4. Fill a burette with distilled water. Record the reading of the initial water level in the burette to the nearest 0.02 cm³.
5. Add water from the burette 1 cm³ at a time, close the conical flask with a rubber bung.
6. Shake the mixture vigorously. If undissolved solid remains, add more water with further shaking.
7. Record the final volume of water added when a clear solution forms in the conical flask and no solid remains.
8. Record the temperature of the solution, once the solution has been made, (earlier temperature would be unhelpful because most solids dissolve endothermically).

Results

name and formula of the salt used
mass of conical flask
mass of conical flask and salt
initial volume of water in the burette
final volume of water in the burette
temperature of solution
qualitative observations of the solution

Calculation

Solubility of _____ (g per 100 g of water) :

Literature value of the solubility of _____ at ____ °C :

% error in solubility :

Conclusion

Questions

1. The solubility of many salts increases as the temperature increases. How do the solubilities of gases vary with temperature?
2. Why does stirring affect the rate at which a salt dissolves in water, but not the solubility of the salt in water.
3. Explain a) hydration (b) hydration energy (c) solvation, and (d) lattice energy