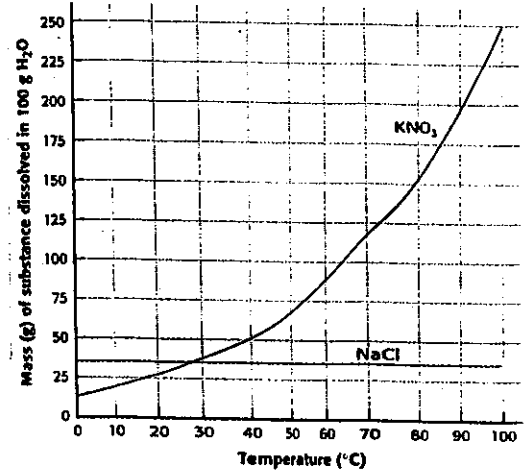


Separating a Mixture by Fractional Crystallization

Introduction: Your job today is to separate a mixture of two salts (NaCl and KNO₃) in water. The substances in a mixture can be separated by physical means. For example, if one substance dissolves in a liquid solvent but another does not, the mixture can be filtered. The substance that dissolved will be carried through the filter by the solvent, but the other substance will not. Because both of the salts dissolve in water, filtering alone cannot separate them. However, there are differences in the way they dissolve. Notice on the graph that there is a difference in the way KNO₃ dissolves depending on the temperature of the solvent. You will make use of this difference in solubility to separate the two salts. This technique is called fractional crystallization.



Procedure:

1. Obtain approximately 50 ml of the solution in a small beaker.
2. Drop the temperature of the solution to approximately -5 degrees Celsius using a saline ice bath.
3. Weigh a piece of filter paper and record in the table.
4. Filter the KNO₃ while cold. (*If the mixture warms up at all, the KNO₃ will dissolve again and pass through the filter paper. If this happens you need to get the solution cold and filter it again)
5. Allow the KNO₃ and filter paper to dry (you may need to wait until the next class period). Weigh the filter paper and KNO₃ and record in table. Calculate the mass of recovered KNO₃.
6. Weigh an evaporating dish and record in the table.
7. Boil the entire filtrate to dryness. (*If splattering occurs you will need to reduce the heat of the flame and you may need to stop and let it dry on its own until the next class period.) Weigh the evaporating dish and NaCl and record in table. Calculate the mass of the recovered NaCl.

Data:

Filter Paper (g)		xxxxxxxxxxx	Evaporating dish (g)	
Filter Paper and KNO ₃ (g)		xxxxxxxxxxx	Evaporating dish and NaCl (g)	
KNO ₃ (g)		xxxxxxxxxxx	NaCl (g)	

Conclusion:

In 50 ml of solution there is _____ g KNO₃ and _____ g NaCl.