Drying an Organic Solution

All organic solvents absorb some water (even the ones which form separate layers). If the solvent has come in contact with water (such as during a washing or extraction), it is necessary to remove this water before evaporating the solution, or it remain behind and contaminate the solute you are trying to obtain. This is accomplished by "drying" the solvent with a salt such as sodium sulfate which can absorb water molecules into its crystal structure.

When anhydrous (dry) sodium sulfate is added to a solvent containing dissolved water, it clumps up and sticks together as it absorbs the water. When there is no more water to absorb, additional sodium sulfate doesn't clump up – the mixture is now said to be "free flowing".

Procedure:

- When you are ready to dry a solution, pour it into a clean beaker (flasks don't work as well). Start by checking to make sure that there are no visible water droplets or a water layer on the bottom or top of the solvent. If there are, pour or pipet the solvent to another beaker, leaving the water behind (it tends to stick to the glass). Visible amounts of water take way too much drying agent to be convenient.

- Next, pour or scoop some anhydrous sodium sulfate into a clean weighing boat, close the lid, and sprinkle some into the solution. Tip the beaker and swirl it around, then hold it up against the light and look through the bottom or look at it against a black countertop to see if you can see any free flowing particles.

- If the particles get stuck to the bottom of the flask, scrape them free with a spatula or you won't be able to see whether there are any moving freely.

- If you have to add so much sodium sulfate that you can't see the bottom when you swirl it, pour the liquid off into another beaker, leaving the sodium sulfate crystals behind. Rinse the crystals with fresh solvent and add it to the liquid you just poured off, and then continue adding sodium sulfate to the solution.

- Keep adding sodium sulfate until you can see some particles moving by themselves. Ask for help if you're not sure what to look for. Note that the entire solution won't ever become free flowing – the particles that have absorbed water won't ever unclump.

- Once you see free-flowing particles, the solution is dry (free from water), even though it's still a liquid. You can now take a TLC if you've been directed to do so. When you are ready to evaporate the solution, pour the liquid off into a large round bottom flask, leaving the solid behind. Add some clean solvent to the crystals and rinse it around to remove any of the desired product that might be stuck to the crystals. Add this solvent to the rest of the dried solution.