You have a series of pipets and the labels have fallen off. You can’t tell by looking what each of the chemicals are, because they are all colorless. Your job is to figure out which chemical is in each pipet by reacting them together.

The pipets contain:
- 6M NaOH
- 3M NH₄Cl
- 1M NaBr
- 0.3M Na₂SO₄
- 0.2M BaCl₂
- 0.2M KIO₃
- 0.2M AgNO₃

The pipets have been number 1 – 7 for convenience. They are probably not ordered in the same order as the list above.

Safety: Some of the chemicals are corrosive to your skin and others are poisonous. Since you don’t know for certain what is in each of the pipets, treat them all as if they were poisonous and corrosive. If you get any chemical on you, rinse the area immediately with water.

Directions:

1. On notebook paper, write the title and purpose.
2. Then write and balance the equations and net ionic equations for all 21 possible reactions. Most of them you will find DO NOT have a net ionic equation.
3. Make a copy of the reaction matrix on the back of this paper in to your notebook. This will serve as your table for data/observations. When you do the experiment you will record the color of the precipitant, if any. **BE SURE YOU RECORD YOUR UNKNOWN NUMBER.** Without this I cannot grade your lab.
4. After you have completed the lab, you will need to write up a conclusion which should include the number of the pipet and the identity of the solution inside of it. You will also need to write a brief error section.

Chemical Directions:

1. Mix one drop of each reagent into the reaction matrix being sure not to touch the pipet to the surface nor allow the drop to touch on other drop while still suspended in the end of the pipet.
2. Small mistakes on the drop sheet can be blotted up with a piece of folded paper towel.
3. View the precipitants both on the drop sheet surface and off the drop sheet surface.
4. Clean up: Make a triple fold of paper towel and blot the chemicals off the plastic sheet. Then you must WASH the plastic sheet with SOAP and WATER and a SCRUB BRUSH. Once you have rinsed after washing, place it on a piece of paper towel to dry.
**Helpful Hints:**

The precipitants are what are important so make careful observations of colors, especially other than white.

When adding a strong base (NaOH) to the ammonium ion, ammonia odor may be detected.

Only silver and barium iodate are insoluble. All other iodates are soluble in water.

The mixture of barium chloride and sodium hydroxide will make a precipitant even though they are not supposed to.

Silver Sulfate should be a precipitant, but it won’t form.

Silver compounds tend to be photosensitive (meaning they react to light and get darker.)

When silver hydroxide forms, it immediately turns into silver oxide. So if you need to look up silver hydroxide’s color, look up silver oxide instead.

To distinguish between colored precipitants, you may look up the colors of precipitated ionic compounds online or in the CRC handbook, Merck index or in chemistry textbooks.

**Reaction Matrix** (copy this in your notebook to take up a complete page)

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