Rules of Thumb: Helpful Numerical Guidelines for Synthetic Organic Experiments

I. Planning

- When a reaction is new to you, one millimole is often a good starting point, if reactant is not limiting. If reactant is precious, it can be divided into three or four portions, or if you are comfortable on small scale, 10 mg is usually the most useful choice.
- If you have run the reaction before, you may choose to run a larger scale reaction. It is best to scale up by no more than 3-4 times the previous experiment, in case the reaction begins to lose efficiency.
- If you need a lot of the product compound, have experience with similar procedures, or feel sure of success (based on the literature, for example), you might start with one or even five grams of reactant.

II. Setup

- Choose a flask that has **at least** twice the capacity of the liquid you want to put in it.
- If no concentration is given, start with 0.1 M of substrate in solvent.

III. Workup

- The reaction mixture should be diluted to 3-4X its original volume.
- When removing amine solvent, wash with 10X the volume of saturated aqueous copper sulfate solution.

IV. Purification

- When you expect less than a gram of product, Chromatography is the safest purification method.
- When the molecular weight of your compound is over 350 amu, beware of Distillation.

Source: http://chem.chem.rochester.edu/~nvd/rulesofthumb.html