Decolorization of Ethanol

In organic chemistry it is often needed to have pure substances. It is common that one will be faced to impure substances or mixtures. There are different separation and purification techniques that are frequently applied in the organic chemistry lab. We will explore decolorization.

Every now and then one has to deal with a liquid or with a solution that has colorful impurities. They are caused by organic molecules that have high affinity for carbon surface. In this experiment we use **decolorizing carbon (aka activated carbon)**. It is a very fine porous solid. Its small particle size gives it a big specific surface area (in the order of hundreds of square meters per gram).

When activated carbon is added to a colored liquid or solution it **adsorbs** the organic molecules responsible for color. It also **absorbs** some of the liquid. Therefore, it is desirable to add the correct amount to remove all impurities but not too much because some of the liquid would be absorbed, hence, lowering our yield.

Activated carbon is so small that is passes through the regular filters used in this lab. In order to solve this problem we have to make a **celite cake**. Celite is Diatomaceous Earth. The important thing is that it’s able to catch the activated carbon particles. The way to make a **celite cake** is by preparing a slurry of celite (powder) and solvent (liquid-ethanol in this case). After the slurry is made it’s passed through a **buchner funnel** that already has a filter paper on it. The filtration must be aided by suction (therefore you will need a filtration flask). After the slurry is filtered has to be washed with liquid (ethanol in this case) until de outcoming liquid is not turbid. Once that is achieved, the dirty filtrate should be removed from the filtration flask and your freshly made **celite cake** will be ready to filter the solution containing activated carbon.