

Determining dosage – teacher notes

Education in Chemistry

September 2017

rsc.li/EiC517-know-your-poison

This experiment accompanies the above article *Know your poison*.

One of the methods used to identify a drug mixture is a mass loss test. In the article, the team crush the pills and dissolve the drug molecules using methanol, leaving the inactive cutting agents and dyes behind. The difference between the pill's mass before and after washing gives a dose estimate.

However, the individual components in a drug mixture will behave differently in different solvents: some will be completely soluble while others may only be slightly soluble or completely insoluble.

In this investigation, suitable for a science club, pupils are challenged to find a solvent that gives a consistent mass loss for common tablets that may be passed off as illicit drugs.

Pupils will need some common over-the-counter remedies in tablet or powder form, together with suitable solvents like water, methanol and ethanol. In addition, they will need pestles and mortars, equipment for filtration and electronic balances (2 decimal place sensitivity is fine).

Once students have developed their method and can use it to get consistent results, a nice conclusion is to give them an unknown tablet from those they have used in their study (either crushed up or with identifying markings removed or obscured). Get them to identify which drug it is using their mass loss method.

In our trials, a very simple method of weighing then crushing the tablets, adding 5–10cm³ of solvent, filtering and then weighing the residue gave reasonably consistent results.