

U3A Science and Technology Group
Meeting 10 October 2022
You can't put that in there!

Ian Royston, this month's presenter, worked for a supplier of chemicals into manufacturers of consumer products such as cosmetics, apparel, food, toys, and he became well versed in the intricacies of regulations around the use of chemical additives in these products. His talk was a summary of consumer chemical regulations, and the conundrums often arising from them.

There is no agreed list of substances that should not be used in consumer products. Instead, there are lists for particular product types (cosmetics, food contact, apparel, toys, etc.), but even here there are very few internationally agreed lists – countries or trading blocks produce their own and, sometimes, particularly for apparel, it is down to individual companies to set their own standards.

As might be expected, the lists focus on heavy metals, carcinogens, mutagens and reprotoxins. However, different limits can apply to the same substance depending on the consumer product. Ian mentioned the situation of a coloured plastic cup; when classed as a toy it could be used by any child of any age, but the same cup classed as a food contact product could not be used by any human of any age!

Acceptable limits can also be too broad. There is much concern about nanoparticles in cosmetics and a limit of no particles of any description smaller than 100nm is defined. However, nanoparticles are generally regarded as being about 10nm in size and many substances in common use that are prepared by grinding, such as flour and cement, fall below the 100nm limit.

Not only can limits be too broad, but so can definitions. One clothing specification includes "Must not contain more than 50ppm of any free halogen in aqueous extraction." Of the six known halogens, two do not exist in nature and one is so reactive it is unlikely to be in its free form, but the specification requires tests for them.

The main method of testing for solid products such as food containers, toys or apparel, is by putting the object in contact with water, or a simulant solution, and then measuring how much of the substance is

leached in the liquid. Standard analytical instruments are then used to make the appropriate measurement.

For all that there are problems, the system does generally work and we have protection from many hazardous materials.