Science & Technology Group
Report by Ruth Lapworth

The first meeting of the year of the Science & Technology group was the last one to be led by Roy Tranter who is standing down as convenor after 14 years. Roy gave an excellent talk on two areas of chemistry: metal organic frameworks (MOFs) which are also known as coordination polymers and transuranium elements (TUEs).

In his overview of these rapidly expanding and exciting subjects Roy first focused on MOFS. These large and complex 3 dimensional structures of transition metal ions bound to organic molecules form holes and channels (in their structures) when linked together by long bridging molecules. The resultant holes and channels are good at trapping other molecules which can be tailored for different actions.

MOFs were first described in the 1980's but interest in these molecular complexes has increased since the Nobel Prize for Chemistry was awarded to 3 researchers in this field in 2025. An example of a MOF occurring in nature is haemoglobin which acts as the transport mechanism for oxygen within the blood. Haemoglobin is a large complex of iron in its ferrous form attached to an organic molecule (protoporhyrin) and subunits of the protein globin. Potential commercial applications of synthetic MOFs include the absorption of carbon dioxide which would otherwise be released into the atmosphere or storage of hydrogen gas which could then be used as a power source.

In the second part of his talk Roy described the discovery of the transuranium elements (TUE's) which are chemical elements with an atomic number greater than 92. They are produced in nuclear reactors or particle accelerators in a small number of laboratories because, with the exception of plutonium, they do not occur naturally. The study of the chemistry of these elements is extremely challenging as they are very expensive to produce, are synthesised in very small quantities, are highly radioactive and disintegrate very quickly.

The group expressed their thanks to Roy not only for this stimulating talk but for his contributions over the years. We are now looking for someone to act as convenor so the group can continue. Anyone interested in this role or joining the Science & Technology Group should contact Hazel McCallum, Groups Co-ordinator, Teesdale u3a.