

REACH AND THE TEACHING OF PRACTICAL CHEMISTRY

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This Note is designed to inform Education Authorities, education and training providers, manufacturers, importers and suppliers of chemicals used in the teaching of practical chemistry, and sets out the understanding of the RSC, CLEAPSS, SSERC and the ASE of how the REACH Regulationⁱ applies to the use of chemicals in the teaching of practical chemistry in EU Schools, Further Education Colleges and Universities. This interpretation is derived from reading the Regulation and from discussions held with the UK Competent Authority and the lead UK Government department on Chemicals, DEFRA.

In summary, it is the informed view of the Royal Society of Chemistry (RSC)ⁱⁱ, CLEAPSSⁱⁱⁱ, SSERC^{iv} and the Association for Science Education (ASE)^v that the Authorisation^{vi} part of the REACH Regulation should NOT prevent or limit the supply or use of chemicals for teaching and learning purposes.

The Authorisation part of REACH is covered in Title VII (Articles 55 to 66). Article 56 provides for the general requirement for manufacturers and users of substances listed in Annex XIV of REACH to be covered by an authorisation. However, Article 56(3) provides an exemption from authorisation for chemicals used in Scientific Research and Development. It differentiates this from product and process orientated research and development (PPORD).

The definition **“Scientific Research and Development”** in Article 3.23 of REACH states: **“Scientific research and development means any scientific experimentation, analysis or chemical research carried out under controlled conditions in a volume less than 1 tonne per year”** (*emphasis added*). **This, in our view, covers the activities included in the teaching of practical chemistry and hence removes the requirement for Authorisation of chemical substances used for practical teaching purposes (i.e. the purpose of the experiment does not have to be research, and could be, for example, instruction or education).** Manufacturers or importers of substances used for teaching purposes would still be required to Register if the substances they manufacture or import are in excess of 1 tonne per year, in which case the R&D exemption is no longer applicable.

Comment

REACH should not be used as an excuse to further reduce the teaching of practical chemistry. Practical chemistry enables pupils and students to develop the key manipulative and problem-solving skills so highly regarded by Higher Education institutions and industry. Practical work also provides a vital opportunity for young people to learn how to safely handle chemicals and to develop a balanced, reasoned understanding of the chemical world around them.

Background

Concerns have recently been raised about the continued availability of some chemicals following the implementation of the REACH Regulation. One of the key objectives of REACH is to provide users of chemicals with enough information to use chemicals safely by developing appropriate Risk Management Measures (RMM) for different uses.

Note: In all publications dealing with practical work from the RSC, CLEAPSS, SSERC and ASE, Risk Management Measures (i.e. “control measures”) are already in place by virtue of the Management of Health and Safety at Work and COSHH Regulations which require risk assessments for all experimental procedures in science education.

In addition, countries in the EU may nominate some chemicals as Substances of Very High Concern (SVHCs) so that their use can be controlled. These are added to a list for possible Authorisation ('Candidate List') and then may be included in Annex XIV i.e. become subject to Authorisation. Annex XIV

sets a “sunset date” for the placing on the market or use of a substance, after which the substance will be prohibited unless an authorisation for a specific use has been granted. The effect of Article 56(3) is that an authorisation is not needed for supply for the purposes of scientific research and development

About 1 600 chemicals are already known to have properties that could make them SVHCs. Not all of these will be proposed for addition to the Candidate List. Among the chemical substances of concern used in practical teaching in schools and universities (the list used in university practical classes will be much larger) are:

- **chromium(VI) compounds** including: sodium chromate(VI), potassium chromate(VI), copper chromate(VI), sodium dichromate(VI), potassium dichromate(VI), ammonium dichromate(VI)
- **cobalt(II) compounds** including: cobalt(II) chloride (including cobalt chloride paper), cobalt(II) nitrate
- **boron compounds** including tetrasodium borate and boric acid.

These chemicals are used in teaching to carry out calibration of instruments, diagnostic tests and to analyse contents of mixtures, to show how one substance can be converted to another, to illustrate the basic principles of chemistry and to illustrate the chemical properties of the elements and their compounds. To date, **none** of the substances above have yet been added to Annex XIV of the Regulation (i.e. no ‘sunset date’ has been set). Therefore, chemicals currently on the market, including most SVHCs, may be used in the teaching of practical chemistry.

Despite this, one member of the EU (acting as the employer of the teachers in that country) has **already** prohibited the use of SHVCs that have appeared on the Candidate List - a decision based on hazard not on control of risk.

The RSC, CLEAPSS, SSERC, ASE and other organisations are increasingly concerned with the decline in the teaching of Practical Chemistry based to a large extent on the often unfounded fear of exposure of pupils and students to hazardous chemicals and a fundamental lack of understanding of the difference between hazard and risk.

The risk a substance poses is dependent on the amount and concentration of the substance involved and the length of exposure to its hazardous properties and the severity of the outcome. In schools, colleges and universities, the teaching of practical chemistry is conducted under **controlled conditions** and generally involves using small amounts of chemicals or dilute solutions and hence, the risks are low.

ⁱ **REACH Regulation** (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL (Corrected version published in the Official Journal of the EU 29 May 2007)

ⁱⁱ **The Royal Society of Chemistry** is the UK Professional Body for chemical scientists and an international Learned Society for the chemical sciences with some 47,500 members worldwide. It is a major international publisher of chemical information, supports the teaching of chemical sciences at all levels and is a leader in bringing science to the public.

ⁱⁱⁱ **CLEAPSS** (www.cleapss.org.uk) is an advisory service providing support in science and technology for a consortium of local authorities and their schools in England, Wales and Northern Ireland, including establishments for pupils with special needs. Independent schools both home and abroad, can apply for associate membership. We offer help from nursery education through to A-level studies or equivalent. Our services include health and safety, risk assessment, storing and use of chemicals, using micro-organisms, storing and using radioactive chemicals and handling laboratory equipment.

^{iv} **Scottish Schools Education Research Centre**, a consortium of the thirty-two Scottish Education Authorities, provides services to elected members and officers of Local Authorities, teachers, student teachers and technicians. SSERC supports and encourages the safe and effective use of innovative and exciting practical activities in science and technology education.

^v **The Association for Science Education** is a dynamic community of teachers, technicians, and other professionals supporting science education and is the largest subject association in the UK. The ASE is an independent and open forum for debate and a powerful force to promote excellence in science teaching and learning, with unique benefits for members.

^{vi} **REACH** is wider than just authorisation, and may well affect how chemicals are used in teaching. As REACH progresses, more information about hazards of chemicals will be collected and this will help to inform about the risks associated with the uses of those chemicals. One part of registration is the Chemical Safety Assessment, and one of the outputs from this is the Derived No Effect Level (DNEL) or Derived Minimal Effect Level (DMEL). These can be different for different populations; children or young workers (e.g. students) could be seen as a vulnerable population for some effects, and so could have lower DNEL/DMEL values than other populations. A school or university may not be able to lower exposures to below the DNEL/DMEL, and so may decide to limit or cease the use of some chemicals.