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To the Principals and Boards of Management of Second level Schools

Discontinued Use of Chemicals – Substances of Very High Concern

A Consolidated EU Regulation on the Registration Evaluation and Authorisation of Chemicals (REACH EC 1907/2006) came into effect in June 2007. It is designed to improve the protection of human health and the environment from the risks that can be posed by some chemicals, and gives rise to new requirements on industry in this area. This Regulation is being implemented progressively.

As part of this process, the European Chemicals Agency (ECHA) has been identifying substances as Substances of Very High Concern (SVHCs). Substances identified as SVHCs are placed on a list (referred to as the ‘candidate list’) for possible inclusion in Annex XIV of the Regulation. Any substance cited in Annex XIV of the Regulation will eventually be subject to authorisation requirements under REACH. Substances are added to ECHA’s candidate list regularly, and Annex XIV will also be updated on a regular basis.

To date a number of substances that are currently used in schools have been designated as Substances of Very High Concern and have been cited on the candidate list and so may eventually be included in Annex XIV of REACH.

To date none of these substances have been added to Annex XIV of the Regulation. However, following a review and based on the advice of the Health and Safety Authority, the Department has decided that **the use of the substances listed hereunder should be discontinued in schools**. This list includes substances currently designated as SVHCs and a number of chemically related substances. Table 1 is set out overleaf giving details of areas where these substances are currently used in Leaving Certificate Chemistry and Junior Certificate Science.

Substances whose use should be discontinued include:

Sodium Chromate, Sodium Dichromate, Potassium Chromate, Potassium Dichromate, Ammonium Dichromate, Copper Chromate, Copper(II) Dichromate and all other chromium(VI) compounds; Cobalt(II) Chloride, Cobalt(II) Nitrate and all other Cobalt(II) compounds; any other chemically related compounds. The use of cobalt chloride paper should also cease.

The chemicals listed should be isolated, stored safely and retained at school level until the school is contacted by a chemicals disposal company. In addition, if schools have any supplies of **Boric Acid, or disodium tetraborate [tetraboron disodium heptaoxide] in either its anhydrous or hydrated forms [i.e. $\text{Na}_2\text{B}_4\text{O}_7$ and $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10 \text{H}_2\text{O}$]** they should also be isolated for disposal as part of this process.

If any of these substances are used in Art Craft and Design (for example in ceramics) they should also be discontinued. Schools are advised that the websites www.nsead.org and www.potclays.com give information on the composition of materials and the health and safety implications which should be considered in Art.

The curriculum implications of this decision are being examined in collaboration with the National Council for Curriculum and Assessment and the State Examinations Commission, and a further communication will issue in due course. In the interim, **these topics will remain as part of the syllabus in terms of the theoretical knowledge of the experimental procedure, and its outcomes, but students will not be required to have physically undertaken the procedure. These topics will, as heretofore, remain examinable in the Leaving Certificate Chemistry Examinations until notice to the contrary is given.**

The Department is currently arranging a tender for the disposal of the chemicals, but it will take some time to complete the procurement process. You will be notified as soon as the implementation arrangements are finalised.

An updated risk assessment and revision of the health and safety guidelines for science laboratories is being prepared in the light of the evolution of developments under the REACH Regulation.

General

Please bring this Circular to the attention of teachers of science and art in the school, and provide a copy to members of the school board of management. This circular may also be accessed at www.education.ie

Margaret Kelly, PO
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Summary of chemicals to be discontinued and for disposal

Ammonium Dichromate	Copper Chromate
Boric Acid	Disodium Tetraborate (tetraboron disodium heptaoxide) in anyhydrous or hydrated forms
Chromium(IV) compounds	Potassium Chromate
Cobalt(II) Chloride	Potassium Dichromate
Cobalt(II) compounds	Sodium Chromate
Cobalt Chloride Paper	Sodium Dichromate
Cobalt Nitrate	
Copper(II) Dichromate	

TABLE 1

Areas of the existing syllabuses where the use of the substance is currently required

The table below shows where the substances are mentioned in the syllabuses.

Item Number	Chemical: Chromium (Cr)/Cobalt (Co)	Syllabus Ordinary level (OL)/Higher level (HL)	Page of syllabus	Statement from the syllabus	Activity
1	Co	OL	18	Demonstration of the oxidation of potassium sodium tartrate by hydrogen peroxide, catalysed by cobalt (II) salts.	Demonstration by the teacher
2	Cr	OL	21	<p>(d) Redox reactions</p> <p>Alcohols:</p> <p>Oxidation using KMnO_4 or $\text{Na}_2\text{Cr}_2\text{O}_7$ to (i) aldehydes and (ii) acids (half equations only required)</p> <p>Oxidation of aldehydes to acids (half equations only required).</p>	<p>Mandatory experiment 7.4 Mandatory experiment 7.5</p> <p>7.4 Preparation and properties of ethanal [properties limited to reactions with (i) acidified potassium manganate (VII) solution, (ii) Fehling's reagent and (iii) ammoniacal silver nitrate].</p> <p>7.5 Preparation and properties of ethanoic acid (properties limited to reactions with sodium carbonate and magnesium).</p>
3.	Co and Cr	OL	24	Le Chatelier's principle. Effect (if any) on equilibrium position	Mandatory experiment 8.1

Item Number	Chemical: Chromium (Cr)/Cobalt (Co)	Syllabus Ordinary level (OL)/Higher level (HL)	Page of syllabus	Statement from the syllabus	Activity
				of concentration, pressure, temperature and catalyst.	Simple experiments to illustrate Le Chatelier's principle: (i) $\text{CoCl}_4^{2-} + 6\text{H}_2\text{O} \rightleftharpoons \text{Co}(\text{H}_2\text{O})_6^{2+} + 4\text{Cl}^-$ (to demonstrate the effects of both temperature changes and concentration changes on an equilibrium mixture). (ii) $\text{Cr}_2\text{O}_7^{2-} + \text{H}_2\text{O} \rightleftharpoons 2\text{CrO}_4^{2-} + 2\text{H}^+$ } (iii) $\text{Fe}^{3+} + \text{CNS}^- \rightleftharpoons \text{Fe}(\text{CNS})^{2+}$ } (to demonstrate the effects of concentration changes on an equilibrium mixture).
4	Co	HL	53	Demonstration of the oxidation of potassium sodium tartrate by hydrogen peroxide, catalysed by cobalt (II) salts.	Demonstration experiment by the teacher
5	Cr	HL	58	Alcohols: Oxidation using KMnO_4 or $\text{Na}_2\text{Cr}_2\text{O}_7$ to (i) aldehydes and (ii) acids (half equations only required). Oxidation of aldehydes to acids (half equations only required)	Mandatory experiment 7.4 Mandatory experiment 7.5 7.4 Preparation and properties of ethanol [properties limited to reactions with (i) acidified potassium manganate (VII) solution, (ii) Fehling's reagent and (iii) ammoniacal silver nitrate].

Item Number	Chemical: Chromium (Cr)/Cobalt (Co)	Syllabus Ordinary level (OL)/Higher level (HL)	Page of syllabus	Statement from the syllabus	Activity
					7.5 Preparation and properties of ethanoic acid (properties limited to reactions with sodium carbonate, magnesium and ethanol).
6	Co and Cr	HL	61	Le Chatelier's principle. Effect (if any) on equilibrium position of concentration, pressure, temperature and catalyst.	<p>Mandatory experiment 8.1</p> <p style="text-align: center;">Mandatory Experiments</p> <p>8.1 Simple experiments to illustrate Le Chatelier's principle:</p> $\text{CoCl}_4^{2-} + 6\text{H}_2\text{O} \rightleftharpoons \text{Co}(\text{H}_2\text{O})_6^{2+} + 4\text{Cl}^-$ <p>(to demonstrate the effects of both temperature changes and concentration changes on an equilibrium mixture).</p> <p>(ii) $\text{Cr}_2\text{O}_7^{2-} + \text{H}_2\text{O} \rightleftharpoons 2\text{CrO}_4^{2-} + 2\text{H}^+$ } (iii) $\text{Fe}^{3+} + \text{CNS}^- \rightleftharpoons \text{Fe}(\text{CNS})^{2+}$ }</p> <p>(to demonstrate the effects of concentration changes on an equilibrium mixture).</p>

Areas of the existing JC Syllabus where the use of the substances is required					
Item Number	Chemical: Chromium (Cr)/Cobalt (Co)	Syllabus Ordinary level (OL)/Higher level (HL)	Page of syllabus	Statement from the syllabus	Activity
	Co	OL and HL	19	OC14 use cobalt chloride paper or anhydrous copper sulfate to test for water	Student practical activity