Possible Sources of Experiments Suggested in the CDC A-Level Chemistry Syllabus 1995

Section	Experiment	Possible Source *(See Notes)*
1.4	Determination of the relative molecular mass of a volatile liquid	APC, NAS, PAAC, **資料冊**
1.5	A quantitative study of electrolysis	CDC
1.7	Titration involving acid-base reactions	APC, **資料冊**
1.7	Titration involving redox titration	APC, CiC, NAS, PAAC
3.2	Determination of enthalpy change of neutralization	CiC, NAS, PAAC
3.2	Determination of enthalpy change of solution	APC, CiC
3.2	Determination of enthalpy change of combustion	APC, NAS
3.3	Determination of enthalpy change of formation of $CaCO_3$ / $MgCO_3$ / MgO	
3.3	Determine enthalpy change of hydration of $MgSO_4$	CDC, APC
4.4	Investigation of the effect of a non-uniform electrostatic field on a jet of liquid	APC, CiC, NAS
4.6	Determination of the strength of the hydrogen bond formed between trichloromethane & ethyl ethanoate	CDC, APC
5.2	Investigation of the factors affecting reaction rate	
5.3	Determination of the order of a reaction	CDC, APC, CiC, NAS, **資料冊**
5.4	Determination of the activation energy of a reaction	CDC, APC, CiC
5.7	Investigation of the effect of Mn^{2+} on the reaction between MnO_4^- and $C_2O_4^{2-}$ in acidic medium	NAS
6.1	Investigation of some reversible reactions	APC
6.1	Determination of the K_c for esterification between ethanoic acid & ethanol	CDC, APC, CiC
6.1	Determination of the K_c for the reaction between Fe^{3+} and NCS^-	
6.1	Investigation of the effect of temperature and pressure change on the reaction $N_2O_4 \Leftrightarrow 2NO_2$	
6.2	Comparison of the strength of weak acids / bases by pH or electrical conductivity measurement	APC
6.2	Determination of the K_a of a weak acid or K_b of a weak base by pH measurement	APC, CiC, NAS, PAAC, **資料冊**
6.2	Comparison of the effects of acid / alkali on pH of buffered and unbuffered solutions	APC, **資料冊**
6.2	Determination of the pH ranges of some acid-base indicators	APC
6.2	Acid-base titrations using method of double indicator	
6.3	Investigation of the e.m.f. of some electrochemical cells	APC, CiC, NAS, **資料冊**
6.3	Testing predictions about the feasibility of redox reactions	APC
7.2	Investigation of the variation of boiling point with composition for different mixture of two miscible liquids	CDC, APC, NAS
7.3	Determination of the partition coefficient of ethanoic acid between water & 2-methylpropan-1-ol	CDC
8.2	Investigation of the properties of oxides and chlorides of the Period 3 elements	APC, CiC, PAAC, **資料冊**
9.1	Flame tests for Li^+, Na^+, K^+, Ca^{2+}, Sr^{2+} and Ba^{2+} ions	CiC, NAS
9.2	Investigation of the effect of heat on carbonates of Group II elements	APC, CiC, NAS
9.2	Investigation of the solubility of sulphates(VI) and hydroxides of Group II elements	APC, CiC, **資料冊**

Section	Experiment	Possible Source *(See Notes)*
10.1	Investigation of the reactions of halogen with alkalis	APC, CiC, NAS, **資料冊**
10.1	Investigation of the reactions of halide ions in solutions	APC, NAS, PAAC, **資料冊**
10.1	Investigation of the reactions of solid halides with sulphuric(VI) acid & phosphoric(V) acid	APC
10.2	Investigation of the action of heat on nitrates(V). Brown ring test for nitrate(V) ions	CiC
10.3	Investigation of the redox properties of sulphur dioxide	NAS
10.3	Test for sulphate(VI) ions using acidified barium chloride solution	
11.2a	Investigation of the redox reactions of vanadium compounds	CDC, APC, CiC, NAS
11.2a	Investigation of the redox reactions of manganese compounds	APC, CiC
11.2b	Investigation of the relative stability of some copper(II) complexes	APC, NAS
11.2d	Investigation of the catalytic action of d-block ions on reaction between peroxodisulphate and iodide ions	APC, PAAC, **資料冊**
12.6	Investigation of some properties of *cis*- & *trans*-butenedioic acids	CDC
12.6	Illustration of optical activity using cross polaroid or a polarimeter	
13.3	Investigation of the chemical properties of cyclohexane, cylcohexene and methylbenzene	APC, CiC, NAS, **資料冊**
13.4	Comparison of the rates of hydrolysis of haloalkanes and halobenzene	CDC, APC, CiC, PAAC
13.4	Investigation of the kinetics of the hydrolysis of 2-chloro-2-methylpropane	NAS
13.5	Preparation of 1-bromobutane from butan-1-ol	CiC, PAAC, **資料冊**
13.5	Investigation of the reactions of some alcohols, and the Lucas's tests for primary, secondary and tertiary alcohols	APC, CiC, NAS, **資料冊**
13.5	Investigation of the reactions of phenol	APC, CiC, NAS, **資料冊**
13.5	Prepare cyclohexene from cyclohexanol	**資料冊**
13.6	Identification of a carbonyl compound by preparing its derivative	APC, CDC, NAS, **資料冊**
13.6	Investigation of the reactions of aldehydes & ketones	APC, CiC, NAS, **資料冊**
13.7	Investigation of the reactions of carboxylic acids	APC, CiC, NAS, **資料冊**
13.7	Preparation of an ester	APC, **資料冊**
13.7	Analysis of commercial aspirin tablets	CDC, CiC
13.8	Investigation of the reactions of amines	APC, CiC, **資料冊**
14.1b	Determination of dissolved oxygen in water samples	CDC, APC, NAS
14.2	Separation of amino acids by paper chromatography	CDC, APC, NAS
14.2	Investigation of the hydrolysis of sucrose and test for reducing sugars	APC, **資料冊**
14.2c	Analysis of sulphur dioxide content in wine	CDC

Notes: (1) This reference list is not meant to be exhaustive.
(2) Some modifications may be needed to meet the requirements of the CDC A-level syllabus.
(3) "CDC" is *Syllabus for Chemistry (Advanced Level)* by the Curriculum Development Council, 1995 (Available in both English & Chinese versions)
"APC" is *Advanced Practical Chemistry* by Thompson & Atteshlis, John Murray, 1985
"CiC" is *Chemistry in Context Laboratory Manual & Study Guide* by Hill & Holman, Nelson, 1995
"PAAC" is *Practical Assessment in Advanced Chemistry* by Earl & Wilford, Blackie, 1990
"NAS" is *Revised Nuffield Advanced Science Chemistry*, Students' Books I & II by Nuffield Foundation, Longman, 1984
「資料冊」即教育署課程發展處編印的《高級程度化學實驗資料冊》1996

Some alternative experiments

***NAS Chemistry Students Book*, Longman 1994**

- Analysis of 'iron tablets'
- Extracting limonene from oranges by steam distillation
- Extraction of iodine from seaweed
- Preparation of oil of wintergreen

***Explorations in Chemistry, A Manual for Discovery*, Kildahl & Varco-Shea, John Wiley & Sons, 1996**

- Project on beverages (studies on pH & acidity; decolorizing samples; and on contents of caffeine, sugar as glucose, alcohol & percent solids in beverages)
- Project on buffers (studies on ethanoic acid & tests on buffer solutions)
- Project on carbonates & hydrogencarbonates (identification of an unknown carbonates or hydrogencarbonates)
- Project on halogens (studies on properties of halogens, application of qualitative identification techniques & gravimetric analysis)

***Salters Advanced Chemistry Activities & Assessment Pack and Teacher's Guide*, University of York, Heinemann, 1994**

- A simple hydrogen-oxygen fuel cell
- Can chloroplasts cause reduction reactions in solution?
- Extracting copper (by dissolving copper ore in ammonia leach solution & displacing the copper from solution with zinc)
- Extraction and identification of the active chemical from willow bark (includes chromatographic identification of the extraction product)
- How fast does carbon dioxide escape from solution? (by using pH measurements)
- How much iron is in an 'iron tablet'?
- How much manganese is there in a paper clip? (using colorimetric methods)
- What reaction conditions are needed to convert 2-hydroxybenzoic acid into aspirin?
- What's in aspartame? (on hydrolysis of artificial sweeteners & chromatographic identification of products)

***Experiments & Techniques in Organic Chemistry*, Pasto, Johnson & Miller, Prentice Hall, 1992**

- Paper chromatography of a food dye

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