

CONTEMPORARY SCIENTIFIC ARCHIVES CENTRE

Catalogue of the papers and correspondence of

SIR CYRIL NORMAN HINSHELWOOD OM, FRS

(1897-1967)

Compiled by Jeannine Alton and Harriot Weiskittel

Deposited in the Library,
The Royal Society, London

CSAC 17/11/74

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Description of the collection

The collection was received from the Physical Chemistry Laboratory, Oxford. It consists almost entirely of laboratory notebooks and experimental observations and results covering the early period of Hinshelwood's work on molecular reactions and gas reactions. Most of this work was conducted in the former laboratory shared by Balliol and Trinity Colleges, consisting, as Sir Harold Thompson describes in his Memoir (Item 1), of cellars, out-houses and a converted bathroom.

Section III contains notes and reports of work on respirator design undertaken by Hinshelwood and his research team for the Chemical Defence Board, Ministry of Supply, during the Second World War. Official documents relating to this work were returned to the P.R.O.

Some of Hinshelwood's papers were accepted and listed by the Library of the Royal Society after his death. They consist of certificates and records of honours and awards, reprints of scientific and non-scientific writings, photographs and press-cuttings, and a box of uncatalogued manuscript material.

Dr. C.J. Danby, of the Physical Chemistry Laboratory, Oxford, has given valuable help in the dating and attribution of certain items in the collection.

Summary of career

1897	b. London
1916 - 18	Department of Explosives, Queensferry Royal Ordnance Factory
1919	Entered Balliol College, Oxford
1920 - 21	Fellow of Balliol College
1921 - 64	Fellow of Trinity College, Oxford
1929	Elected to the Royal Society
1937 - 64	Dr. Lee's Professor of Chemistry, Oxford
1943	Davy Medal
1946	Bakerian Lecture
1946 - 47	President, Chemical Society
1949	Royal Medal
1948	Knight Bachelor
1955 - 60	President, Royal Society
1956	Nobel Prize for Chemistry
1959	President, Classical Association

1960 Presidential Address, Royal Society Tercentenary
1960 Leverhulme Medal
1960 Order of Merit
1961 - 63 President, Faraday Society
1962 Copley Medal
1964 - 65 President, British Association for the Advancement of Science

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I. Biographical

1. Memoir, by Sir Harold Thompson, Biographical Memoirs of Fellows of the Royal Society, Vol. 19, pp. 375-434.
2. Hinshelwood's 'Complete List of Publications in Chronological Order 1919 - 1964'

II. Laboratory notebooks and working papers (all are manuscript unless indicated otherwise)

3. Notebook labelled on first page 'Oxidation of Phenol Derivatives. 1919
Decomposition of Malonic Acid in the liquid-supercooled state and in the solid state.' Containing:
 - a. Draft of 'Oxidation of Nitrophenols by Potassium Permanganate' with charts and graphs, dated 12-7-19
 - b. Entry labelled 'Thermometer Standardisation'
 - c. Series of experiments on 'The rate of decomposition of malonic acid' with charts and graphs, dated 17-11-19
 - d. Entry labelled 'Summary of solid state expts.'
4. Notebook containing: 1920
 - a. 'Transformation Rhombic \rightleftharpoons monoclinic sulphur - influence of physical state'
 - b. Set of experiments on 'iodine vaporisation' dated October, 1920
 - c. 'Notes on the theory of supercooling'
 - d. 'Supercooling. Experiments with Salol, Phenol': compilation of results, and notes on others' work
5. Notebook containing set of experiments labelled 'Acetone' and 1922
dated 8-5-22. Set of experiments beginning at other end of notebook labelled 'Investigation of some monomolecular reactions' (with synopsis) followed by 2 sets of experiments on 'thermal decomposition of chlorine monoxide' with notes and graphs interleaved
6. Notebook labelled 'chlorine monoxide' and dated 12-2-24 containing 1924
compilation of results by CNH and unidentified co-worker. Notebook also contains 2 sets of experiments at back of book labelled 'Thermal decomposition of ammonia-phosphine apparatus' and 'Nitrous oxide'. Miscellaneous notes (some written on verso of stationery samples) and various unlabelled graphs.
7. Notebook containing: 1924
 - a. Unidentified set of experiments
 - b. 'Thermal decomposition of ammonia on platinum' dated 28-6-24
 - c. 'Nitrous oxide: hot wire expts.'
8. Notebook containing: 1924 - 25
 - a. 'Calibration of platinum wire (2)' and dated 17-9-24, with set of graphs charting influence of temperature on rate of decomposition of N_2O on a platinum wire
 - b. 'Experiments on the influence of pressure'
 - c. 'Decomposition of N_2O on the surface of a gold wire' (some calculation in another hand)

8. contd.

- d. 'Interaction of CO_2 and H_2 on heated tungsten wire'
 - e. 'Hydrogen iodide on gold'
 - f. 'Decomposition of HI on platinum'
- Series of experiments at back of book labelled:
- g. 'Decomposition of ammonia on tungsten filament' and dated February 11, 1925
 - h. 'Interaction of NO and H_2 ' with miscellaneous unlabelled graphs

9. Notebook containing:

1925 - 26

- a. 'Acetone decomposition'
 - b. 'Aldehyde decomposition'
- Sets of experiments at back of book labelled:
- c. 'Nitric oxide decomposition on Pt'
 - d. 'Propionic aldehyde decomposition'

10. Notebook labelled on cover ' Me_2O PrCHO + H_2 ' containing:

1927

- a. Set of experiments with 'Diethyl ether' and dated January, 1927
- b. 'Formaldehyde tests'
- c. 'Influence of hydrogen on acetaldehyde decomposition'
- d. 'Propionic aldehyde and hydrogen'
- e. 'Acetaldehyde and nitrogen'

11. Notebook labelled 'hydrogen and oxygen'. Sets of experiments at other end of notebook labelled:

1926

- a. 'Analysis of decomposition products of methylpropylether'
- b. 'Catalysed decomposition of diethyl ether'

12. Notebook containing:

1927

- a. 'Hydrogen Oxygen combinations' dated September 1927 (56 experiments)
- b. 'New high Temp. pressure series - empty bulb (new)'
- c. 'Experiments in Worcester porcelain bulb' (some runs are sub-headed 'nitrogen' or 'argon')

13. Notebook with first set of experiments labelled 'Combination of hydrogen and oxygen', followed by another set of 47 experiments called 'Series B', 'Series C' and 'Series D'

1927 - 28

14. Small notebook labelled 'Series E' (presumably following Item 13 in sequence) with summary of results on inside of front cover

1927 - 28

15. Package of graphs charting the influence of steam, hydrogen pressure, helium, argon, nitrogen, oxygen pressure and silica on the rate of reaction of hydrogen and oxygen combinations at various temperatures

16. Notebook labelled 'Decomposition of CH_3CHO on gold' containing various sets of experiments, miscellaneous calculations and graphs e.g. 'acetaldehyde on platinum - rhodium wire' and 'acetaldehyde decomposition calibration of gold wire'

1928

17. Notebook labelled ' $\text{H}_2/\text{O}_2/\text{Pt}$ ' and on back cover 'new $\text{H}_2\text{O}_2/\text{Pt}$ series' with miscellaneous notes interleaved

1929

18. Notebook inscribed inside front cover 'bath corrections' containing various experiments with benzoic acid, isopropyl alcohol, acetic acid and benzyl alcohol. 1930 - 31
Notebook of calculations labelled 'HCl EtOH'
Notebook of various sets of experiments labelled 'MeOH
HAC
HCl'
19. Package labelled 'Phosphine u.v. light' containing: 1930
a. Notebook labelled 'Phosphine' dated 7-5-30 to 26-6-30.
Back cover of notebook is labelled 'catalysis of decomposition of $\begin{matrix} \text{CH}_3 & & \text{CH}_3 \\ | & & | \\ \text{CH}_3 & \text{CH-O-CH} & \text{CH}_3 \end{matrix}$ by halides'
Both portions of notebook contain experimental results and CNH's conclusions. 4 graphs interleaved (one labelled 'U.V. lamp chart') with 4 pages of notes (some written on verso of examination scripts)
b. Notebook (not labelled or dated) containing experimental results and graphs.
c. 10 pages of miscellaneous notes
d. Typescript of abstract beginning 'Mixtures of phosphine and oxygen at ordinary temperatures. . .'
20. Notes on 'Grimm, Ruf and Wolff, Zeit.fur Physikalische Chemie, B13, 1931, p. 299' 1931
21. Notebook containing: 1931
a. 'N₂O expts'
b. 'Another series of expts to find NO produced at various stages of the reaction' and dated January 1931
c. 'Summary to date of experiments made by CNH' and dated 1-3-31
d. Various untitled experiments
22. Package labelled 'Ozone' containing descriptions, results and calculations of various runs; miscellaneous notes (many written on verso of examination scripts) and graphs charting the various runs (numbered 1-22) 1931
23. Notebook (not in CNH's hand) titled 'Summary of experimental results on the reaction between H₂ and O₂ in vessels of silver and of silica with effect of (NO)₂, (N₂)₂ and rods of silica, silver, aluminium and nickel' with initials 'CNH, ACR and GAMH, Hilary Term 1932'. Findings published as 'The Combination of hydrogen and oxygen in a silver vessel' (with E.A. Moelwyn-Hughes and A.C. Rolfe) Proc.Roy.Soc., 1933, A139, 521. 1932
24. Package labelled 'N₂O and halogens' containing miscellaneous notes and graphs (many labelled 'Disassociation of iodine' '...of chlorine', '...of bromine' etc) and 2½ page typescript (untitled and incomplete) 1932 - 33
25. Notebook labelled on cover 'Reaction between EtCl, EtBr, EtI and KOH in alcoholic solutions' containing notes and graphs and interleaved report (in unidentified hand) on another's work 1933

26. Package labelled 'HAc in MeOH' containing: 1933 - 34
a. Typescript with corrections of 'The Kinetics of Esterification Part I. The Reaction between Acetic Acid and Methyl Alcohol'
b. Graphs labelled 'HAc in MeOH in anisol', 'Interaction of acetic acid and methyl alcohol in methyl alcohol solutions' with accompanying notes.
c. Miscellaneous graphs and notes.
27. Package labelled 'Cl NH₂' containing: 1934
a. Notes on 'Cain and Nicoll, J.C.S., 1902 P. 1412'
b. Notes on 'J.S. Reese, Chem.Rev., 1934, 14, 55'
c. Miscellaneous notes and graphs (several labelled 'diazo compounds')
d. 3 page typescript of 'The Benzoylation of Nitranilines in Benzene Solution' (with W.B.S. Newley and L.A.R. Staveley) Trans.Far.Soc., 1934, 30, p 597, and 3 sets of Ms. notes which formed basis of article.
28. Notebook labelled 'Quaternary ammonium salts' containing 1937 - 38
various sets of calculations with miscellaneous notes (on verso of examination scripts) and 7 graphs (one labelled 'Pyridine and methyl iodide in various solvents') interleaved

III. War work

29. Graphs of desorption distribution (in various hands) with notes and results labelled 'CCl₄ desorption - experimental results', 'Water desorption', 'Water Diffusion', tabulated results, and 'Cyanogen chloride - desorption distribution' 1940 - 43
30. 'Desorption' typescript summaries of experimental results; 1940 - 43
'Calculated distribution on water' Ms. summaries of results (in unidentified hands), graphs
31. Package of 6 graphs describing desorption by a dry air stream following the passage of a wet stream 1940 - 43
32. Graphs and notes showing 'calculated distribution during desorption H₂O on B668' in another hand 1940 - 43
33. Miscellaneous notes labelled 'Retentivity Bible, 1.2.43', 1943
'Retentivity Action, 27.3.43', 'Adsorption. The Transport Equation', 'The sorption process in a gas stream with a straight line Isotherm.', 'Distribution', and tabular summary of 'position of 50% saturation point'
34. File labelled 'Reports from J.G.D., C.J.D., J.S.A.F., R.M.L. - 1939
M.T. 1939'. Various Ms. drafts including 'Studies in adsorption on Charcoal I' and 'Studies in adsorption on Charcoal II', charts, graphs, and miscellaneous notes 1939
35. 'First Interim Report' from the Department of Inorganic and Physical Chemistry, Oxford to the Ministry of Supply; 1939
typescripts of Introduction, Appendix A (I) with accompanying graphs, Appendices IV - VII, Appendix XI

36. 'Second Interim Report from the Department of Inorganic and Physical Chemistry Oxford' containing 'introduction and general summary', 'comparison of the behaviour of various charcoals' and 12 appendices (see contents page of report for detailed list): typescripts with accompanying graphs dated 1 January/29 February 1940
37. 'Oxidation Catalysts': typescript with CNH's annotations on contents page, 12 pp. n.d.
38. 'Mixture of Two Gases': typescript with extensive corrections, 'Multiple layer respirator systems' and 'Respirator systems containing layers and mixtures of different charcoals': typescripts with corrections dated 8.11.40 with accompanying tables 1940
39. 'The Desorption of Gases from Charcoal (With special reference to problems of chemical warfare)': CNH's draft of the introduction, Ms. and typescript draft with corrections of Sections I and II, typescript list of diagrams 1943
40. 'The Desorption of Gases from Charcoal': typescript drafts of Sections III, IV and V with extensive Ms. corrections 1943
41. 'The Desorption of Gases from Charcoal': Ms. and typescript drafts of Sections VII and VIII 1943
42. Charts and diagrams prepared for report 1943
43. 'The Desorption of Gases from Charcoal (with special reference to problems of chemical warfare)' report prepared by Department of Inorganic and Physical Chemistry, Oxford University for the Ministry of Supply and dated July 1943 1943
44. 'The Process of Charcoal Activation in relation to the Properties of the Product' report prepared by the Department (for the Ministry of Supply) and dated September 1942 1942
45. 'The Properties of Coppered Coal Charcoals' report prepared by the Department (for the Ministry of Supply) and dated October 1943 1943