

## JOURNAL OF THE CHEMICAL SOCIETY

**Chemical Communications**

**Number 12  
1988**

---

**CONTENTS**

- 757 Identification of L-Nitrosuccinate as an Intermediate in the Fungal Biosynthesis of 3-Nitropropanoic Acid **Robert L. Baxter, A. Bryan Hanley, Henry W.-S. Chan**
- 758 Correlation of the Energies of  $\pi$ -Bonds between Carbon and Other Elements with E.S.R. Hyperfine Coupling Constants **Christopher J. Rhodes**
- 760 A Stereoselective Route to Vicinally Substituted Cyclopentane- and Cyclobutane-carboxylates **Deukjoon Kim, Yoo Mi Jang, In O Kim, Sang Woo Park**
- 761 Ketene Silyl Acetal Chemistry; Diastereofacial Selectivity of 1,3-Addition of Chiral Nitrones **Yasuyuki Kita, Osamu Tamura, Fumio Itoh, Hiroko Kishino, Takashi Miki, Masako Kohno, Yasumitsu Tamura**
- 763 Hydrogen Isotope Labelling of Organic Compounds catalysed by Microporous Aluminophosphates: Specificity of Tritium Gas Exchange **John L. Garnett, Eric M. Kennedy, Mervyn A. Long, Chit Than, Ashley J. Watson**
- 765 Nucleotide Base Recognition: Ditopic Binding of Guanine to a Macroyclic Receptor containing Naphthyridine and Naphthalene Units **Andrew D. Hamilton, Nalin Pant**
- 766 The Rate Controlling Step in the Oxidative Coupling of Methane over a Lithium-promoted Magnesium Oxide Catalyst **Noel W. Cant, Christopher A. Luke, Peter F. Nelson, Ralph J. Tyler**
- 768 Monochlorogallane: Synthesis, Properties, and Structure of the Dimer  $H_2Ga(\mu\text{-Cl})_2GaH_2$  in the Gas Phase as determined by Electron Diffraction **Michael J. Goode, Anthony J. Downs, Colin R. Pulham, David W. H. Rankin, Heather E. Robertson**
- 770 1-Trimethylstannylphospholes as Precursors of  $\eta^5$ -Phospholyl Complexes. Synthesis of ( $\eta^5$ -Phospholyl)trichlorotitanium-(iv) Complexes **F. Nief, F. Mathey**
- 771 Electrochemical Modulation of Luminescence from an Interfacial Probe during Redox Switching of Polypyrrole **Eric W. Tsai, Leslie Phan, Krishnan Rajeshwar**
- 773 Solution Structures of Sharpless Epoxidation Catalysts **Pierre G. Potvin, Patrick C. C. Kwong, Michael A. Brook**
- 775 On the Biosynthesis of Ethylene: Further Evidence for Stepwise Enzymatic Cyclopropane Ring Cleavage **Jack E. Baldwin, Robert M. Adlington, Gilles A. Lajoie, Christopher Lowe, Pete D. Baird, Keith Prout**
- 777 Studies of [3,3]Sigmatropic Rearrangements: Rearrangement of 3-(4-p-Tolyloxybut-2-ynyloxy)[1]benzopyran-2-one **K. C. Majumdar, R. N. De, A. T. Khan, S. K. Chattopadhyay, K. Dey, A. Patra**
- 779 The Effect of Basicity of Dopant Anions on the Conductivity of Polypyrrole Films **Susumu Kuwabata, Jiro Nakamura, Hiroshi Yoneyama**
- 780 Asymmetric Synthesis of Phenyl Alkyl Sulfoxides via the Non-destructive Mediation of the Chiral Iron Acyl [ $(\eta^5\text{-C}_5\text{H}_5)\text{Fe}(\text{CO})(\text{PPh}_3)\text{COCH}_2\text{Me}$ ] **Stephen G. Davies, G. Lance Gravatt**
- 782 Synthesis and X-Ray Structure of  $[\{\text{Li}(\text{thf})_2\text{PHMes}\}_n]$  (thf = tetrahydrofuran; Mes = 2,4,6-Me<sub>3</sub>C<sub>6</sub>H<sub>2</sub>) **Evamarie Hey, Frank Weller**
- 783 Competitive Cyclopropanation and Cross-metathesis Reactions of Alkenes Catalysed by Diruthenium Tetrakis Carboxylates **Alfred F. Noels, Albert Demonceau, Eric Carlier, André J. Hubert, Rosa-Linda Márquez-Silva, Roberto A. Sánchez-Delgado**
- 785 Preparation, Crystal Structure, and Physical Properties of a Pyrogallol-bridged Vanadium(III) Complex **Seunghee Lee, Koji Nakanishi, Michael Y. Chiang, Richard B. Frankel, Kevos Spartalian**
- 786 Aromatic Ring Dynamics in Crystalline Penicillins from Variable Temperature  $^{13}\text{C}$  Cross-polarisation Magic-angle-spinning N.M.R. **J. Mark Twyman, Christopher M. Dobson**
- 788 Fourier Transform I.R. Detection of Adsorbed Hydrogen on a Cu-Zn-Cr Low Temperature Methanol Synthesis Catalyst **Guido Busca, Angelo Vaccari**
- 790 The Fluorescence of the Chromophore of the Green Fluorescent Protein of *Aequorea* and *Renilla* **Frank McCapra, Zia Razavi, Adrian P. Neary**

- 791 Studies on Steroidal Plant-growth Regulators. A New Route for the Efficient Synthesis of the  $2\alpha,3\alpha$ -Dihydroxy-7-oxa-6-oxo- $\beta$ -homo Structural Unit of Brassinolide **Wei-Shan Zhou, Biao Jiang, Xin-Fu Pan**
- 793 Evidence for Enhancement of Catalysis by a Second Metal in Heterobinuclear Complexes: *X*-Ray Structure of  $[\text{H}(\text{CO})(\text{PPh}_3)_2\text{Ru}(\text{bim})\text{Rh}(\text{cod})]$  ( $\text{bim} = 2,2'$ -bi-imidazolato,  $\text{cod} = \text{cyclo-octa-1,5-diene}$ ) **María P. García, Ana M. López, Miguel A. Esteruelas, Fernando J. Lahoz, Luis A. Oro**
- 795 Oxidative Cleavage of Carbon–Silicon Bonds by Dioxygen: Catalysis by a Flavin–Dihydronicotinamide Redox System **Kohei Tamao, Takashi Hayashi, Yoshihiko Ito**
- 797 Methane Adsorption on a Working Samarium Oxide Catalyst and its Role in Hydrocarbon Formation during High Temperature Partial Oxidation **Alfred Ekstrom, Jacek A. Lapszewicz**
- 799 Formation of Three-vertex Metallaboranes from Monoborane Precursors: *X*-Ray Crystal Structures of the Molybdenum and Ruthenium Complexes  $[\text{Mo}(\eta\text{-C}_5\text{H}_5)_2\text{H}(\eta^2\text{-B}_2\text{H}_5)]$  and  $[\text{Ru}(\eta\text{-C}_5\text{Me}_5)_2(\text{PMe}_3)(\eta^2\text{-B}_2\text{H}_7)]$  **Peter D. Grebenik, Malcolm L. H. Green, Malcolm A. Kelland, John B. Leach, Philip Mountford, Graham Stringer, Neil M. Walker, Luet-Lok Wong**
- 801 Enantioselective Complexation of Bilirubin with Cyclodextrins and Non-cyclic Oligosaccharides **Koji Kano, Kazuhiro Yoshiyasu, Shizunobu Hashimoto**
- 802 Aldol Condensation *via* Germanium Enolates. Stereoselection Dictated by the Co-presence of Lithium Halides **Yoshinori Yamamoto, Jun-ichi Yamada**
- 804 Carbon–Hydrogen Bond Activation by a Nickel Complex for the Catalytic Formation of Dienyne Systems **Mitsuo Ishikawa, Joji Ohshita, Yoshihiko Ito, Akio Minato**
- 806 Quinone Complexes of Palladium: Synthesis and Characterisation of the Dimer  $[\text{Pd}_2\{\text{Pd}(\text{dbsq})_2\}_2]$  ( $\text{dbsq} = 3,5\text{-di-}t\text{-butyl-1,2-benzosemiquinone}$ ) formed by the Reaction between 3,5-Di-*t*-butyl-1,2-benzoquinone and Palladium(0) **Glenn A. Fox, Cortlandt G. Pierpont**
- 807 Intramolecular Peterson Olefination of *ortho*-Trimethylsilylmethyl Anilides: a New Synthesis of *N*-Methylindoles **Giuseppe Bartoli, Marcella Bosco, Renato Dalpozzo, Paolo E. Todesco**
- 809 A Short Formal Synthesis of the Carbapenem Antibiotic  $(\pm)$ -PS-5 **José M. Odriozola, Fernando P. Cossío, Claudio Palomo**
- 810 Novel Quinaldic Acids for Selective Chelation of Cadmium(II). *X*-Ray Crystal Structure of  $[\text{Cd}(\text{C}_{18}\text{H}_{12}\text{NO}_4)_2](\text{Me}_2\text{SO})\cdot 2\text{H}_2\text{O}$  **Christina Moberg, Mamoun Muhammed, Göran Svensson, Michael Weber**
- 812 Preparation of Silica Gel-bound Macrocycles and their Cation-binding Properties **Jerald S. Bradshaw, Ronald L. Bruening, Krzysztof E. Krakowiak, Bryon J. Tarbet, Merlin L. Bruening, Reed M. Izatt, (the late) James J. Christensen**
- 814 Zoning of Aluminium among Different Crystallographic Sites in Zeolite Omega **Pascale Massiani, François Fajula, Francesco Di Renzo**
- 815 Total Synthesis of  $(\pm)$ -Dysideapalaunic Acid **Hisahiro Hagiwara, Hisashi Uda**
- 817 Effect of Intramolecular Chelation on Configurational Interconversion of Sulphur-stabilized Carbanions **Rikuhei Tanikaga, Kazumasa Hamamura, Ken Hosoya, Aritsune Kaji**
- 819 First Example of a 1,2,4-Triphosphabuta-1,3-diene Complex: Synthesis and Crystal and Molecular Structure of  $[\text{Co}(\eta^5\text{-C}_2\text{R}_2\text{P}_3)(\eta^4\text{-C}_2\text{R}_2\text{HP}_3)]$  ( $\text{R} = \text{Bu}^t$ ) **Rainer Bartsch, Peter B. Hitchcock, John F. Nixon**
- 820 A Novel Catalyst for the Low Pressure, Low Temperature Homologation of Methanol **Kenneth G. Moloy, Richard W. Wegman**
- 822 Selenium Analogues of 2-(Thiopyran-4-ylidene)-1,3-dithiole as Novel Unsymmetrical Electron Donors **Yutaka Shiomi, Yoshio Aso, Tetsuo Otsubo, Fumio Ogura**
- 823 Direct Elaboration of Pent-4-enyl Glycosides Into Disaccharides **Bert Fraser-Reid, Peter Konradsson, David R. Mootoo, Uko Udodong**
- 825 New Synthesis of *N*-Alkyl 2,2-Dialkylcyclopropylamines *via*  $\alpha$ -Chloro Imines **Norbert De Kimpe, Pascal Brunet, Roland Verhé, Nicéas Schamp**
- 827 A Short Synthesis of  $(\pm)$ -Cuparene **Hiroyuki Ishibashi, Taru Su So, Hiroshi Nakatani, Kenjiro Minami, Masazumi Ikeda**
- 828 Stereospecific Amino Acid Synthesis; Preparation of the  $\gamma$ -Anion derived from Glutamic Acid **Jack E. Baldwin, Michael North, Anthony Flinn, Mark G. Moloney**
- 829 Application of Microwave Heating Techniques for the Synthesis of Solid State Inorganic Compounds **David R. Baghurst, D. Michael P. Mingos**
- 830 A Convenient Route to an Acetylenic C<sub>35</sub> Hopanoid and the Absolute Configuration of the Side-chain of Aminobacteriohopanetriol **Serge Neunlist, Michel Rohmer**
- 832 Oxygen Enhanced Hydrogen Exchange and Hydrogenation over Supported Gold Catalysts **Shuichi Naito, Mitsutoshi Tanimoto**
- 834 A One Step Synthesis of Phosphine Substituted Sulphur Capped Clusters from Phosphine Sulphides: *X*-Ray Crystal Structures of  $[\text{Fe}_3(\text{CO})_8(\mu_2\text{-CO})(\mu_3\text{-S})(\text{Ph}_2\text{PC}_2\text{Pri})]$  and  $[\text{Ru}_3(\text{CO})_8(\mu_3\text{-S})_2(\text{Ph}_2\text{PC}_2\text{But}^t)]$  **Graeme Hogarth, Nicholas J. Taylor, Arthur J. Carty, Andre Meyer**
- 836 Aggregation of Steroidal Lariat Ethers: The First Example of Nonionic Liposomes (Niosomes) formed from Neutral Crown Ether Compounds **Lourdes E. Echegoyen, Jeanette C. Hernandez, Angel E. Kaifer, George W. Gokel, Luis Echegoyen**
- 838 Highly Stereoselective Ring Opening Reaction of Tropone Oxime Tosylate with Nucleophiles **Takahisa Machiguchi, Toshio Hasegawa, Megumi Ohno, (the late) Yoshio Kitahara, Makoto Funamizu, Tetsuo Nozoe**

**Corrigenda**

- 840 Dissolution of Copper Metal in a Dimethyl Sulphoxide-Carbon Tetrachloride Mixture **Yasuyuki Tezuka, Masamitsu Miya, Akio Hashimoto, Kiyokazu Imai**
- 840 Synthesis of 2,3-Methano-glutamic and -pyroglutamic Acid **Luther F. Elrod, Elizabeth M. Holt, Claudio Mapelli, Charles H. Stammer**
- 840 Modelling Vinyl Ether Formation in Rifamycin S **John A. Murphy, Christopher W. Patterson, Nicholas F. Wooster**
- 840 Direct Evidence to support the Proposal that ZSM-23 is a Recurrently Twinned Variant of Zeolite Theta-1 **John M. Thomas, G. Robert Millward, Donald White, Subramanian Ramdas**

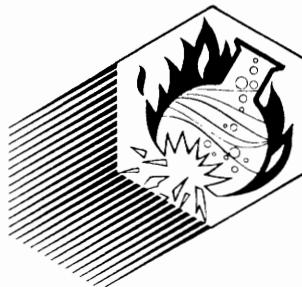
**AUTHOR INDEX**

- Adlington, Robert M., 775  
 Aso, Yoshio, 822  
 Baghurst, David R., 829  
 Baird, Pete D., 775  
 Baldwin, Jack E., 775, 828  
 Bartoli, Giuseppe, 807  
 Bartsch, Rainer, 819  
 Baxter, Robert L., 757  
 Bosco, Marcella, 807  
 Bradshaw, Jerald S., 812  
 Brook, Michael A., 773  
 Bruening, Merlin L., 812  
 Bruening, Ronald L., 812  
 Brunet, Pascal, 825  
 Busca, Guido, 788  
 Cant, Noel W., 766  
 Carlier, Eric, 783  
 Carty, Arthur J., 834  
 Chan, Henry W.-S., 757  
 Chattopadhyay, S. K., 777  
 Chiang, Michael Y., 785  
 Christensen, (the late) James J., 812  
 Cossío, Fernando P., 809  
 Dalpozzo, Renato, 807  
 Davies, Stephen G., 780  
 De, R. N., 777  
 De Kimpe, Norbert, 825  
 Demonceau, Albert, 783  
 Dey, K., 777  
 Di Renzo, Francesco, 814  
 Dobson, Christopher M., 787  
 Downs, Anthony J., 768  
 Echegoyen, Lourdes E., 836  
 Echegoyen, Luis, 836  
 Ekstrom, Alfred, 797  
 Elrod, Luther F., 840  
 Esteruelas, Miguel A., 793  
 Fajula, François, 814  
 Flinn, Anthony, 828  
 Fox, Glenn A., 806  
 Frankel, Richard B., 785  
 Fraser-Reid, Bert, 823  
 Funamizu, Makoto, 838  
 García, María P., 793  
 Garnett, John L., 763  
 Gokel, George W., 836  
 Goode, Michael J., 768  
 Gravatt, G. Lance, 780  
 Grebenik, Peter D., 799  
 Green, Malcolm L. H., 799  
 Hagiwara, Hisahiro, 815  
 Hamamura, Kazumasa, 817  
 Hamilton, Andrew D., 765  
 Hanley, A. Bryan, 757  
 Hasegawa, Toshio, 838  
 Hashimoto, Akio, 840  
 Hashimoto, Shizunobu, 801  
 Hayashi, Takashi, 795  
 Hernandez, Jeanette C., 836  
 Hey, Evamarie, 782  
 Hitchcock, Peter B., 819  
 Hogarth, Graeme, 834  
 Holt, Elizabeth M., 840  
 Hosoya, Ken, 817  
 Hubert, André J., 783  
 Ikeda, Masazumi, 827  
 Imai, Kiyokazu, 840  
 Ishibashi, Hiroyuki, 827  
 Ishikawa, Mitsuo, 804  
 Ito, Yoshihiko, 795, 804  
 Itoh, Fumio, 761  
 Izatt, Reed M., 812  
 Jang, Yoo Mi, 760  
 Jiang, Biao, 791  
 Kaifer, Angel E., 836  
 Kaji, Aritsune, 817  
 Kano, Koji, 801  
 Kelland, Malcolm A., 799  
 Kennedy, Eric M., 763  
 Khan, A. T., 777  
 Kim, Deukjoon, 760  
 Kim, In O, 760  
 Kishino, Hiroko, 761  
 Kita, Yasuyuki, 761  
 Kitahara, (the late) Yoshio, 838  
 Kohno, Masako, 761  
 Konradsson, Peter, 823  
 Krakowiak, Krzysztof E., 812  
 Kuwabata, Susumu, 779  
 Kwong, Patrick C. C., 773  
 Lahoz, Fernando J., 793  
 Lajoie, Gilles A., 775  
 Lapszewicz, Jacek A., 797  
 Leach, John B., 799  
 Lee, Seunghee, 785  
 Long, Mervyn A., 763  
 López, Ana M., 793  
 Lowe, Christopher, 775  
 Lukey, Christopher A., 766  
 McCapra, Frank, 790  
 Machiguchi, Takahisa, 838  
 Majumdar, K. C., 777  
 Mapelli, Claudio, 840  
 Márquez-Silva, Rosa-Linda, 783  
 Massiani, Pascale, 814  
 Mathey, F., 770  
 Meyer, Andre, 834  
 Miki, Takashi, 761  
 Millward, G. Robert, 840  
 Minami, Kenjiro, 827  
 Minato, Akio, 804  
 Mingos, D. Michael P., 829  
 Miya, Masamitsu, 840  
 Moberg, Christina, 810  
 Moloney, Mark G., 828  
 Moloy, Kenneth G., 820  
 Mootoo, David R., 823  
 Mountford, Philip, 799  
 Muhammed, Mamoun, 810  
 Murphy, John A., 840  
 Naito, Shuichi, 832  
 Nakamura, Jiro, 779  
 Nakanishi, Koji, 785  
 Nakatani, Hiroshi, 827  
 Neary, Adrian P., 790  
 Nelson, Peter F., 766  
 Neunlist, Serge, 830  
 Nief, F., 770  
 Nixon, John F., 819  
 Noels, Alfred F., 783  
 North, Michael, 828  
 Nozoe, Tetsuo, 838  
 Odriozola, José M., 809  
 Ogura, Fumio, 822  
 Ohno, Megumi, 838  
 Ohshita, Joji, 804  
 Oro, Luis A., 793  
 Otsubo, Tetsuo, 822  
 Palomo, Claudio, 809  
 Pan, Xin-Fu, 791  
 Pant, Nalin, 765  
 Park, Sang Woo, 760  
 Patra, A., 777  
 Patterson, Christopher W., 840  
 Phan, Leslie, 771  
 Pierpont, Cortlandt G., 806  
 Potvin, Pierre G., 773  
 Prout, Keith, 775  
 Pulham, Colin R., 768  
 Rajeshwar, Krishnan, 771  
 Ramdas, Subramanian, 840  
 Rankin, David W. H., 768  
 Razavi, Zia, 790  
 Rhodes, Christopher J., 758  
 Robertson, Heather E., 768  
 Rohmer, Michel, 830  
 Sánchez-Delgado, Roberto A., 783  
 Schamp, Niceas, 825  
 Shiomi, Yutaka, 822  
 So, Taru Su, 827  
 Spartalian, Kevos, 785  
 Stammer, Charles H., 840  
 Stringer, Graham, 799  
 Svensson, Göran, 810  
 Tamao, Kohei, 795  
 Tamura, Osamu, 761  
 Tamura, Yasumitsu, 761  
 Tanikaga, Rikuhei, 817  
 Tanimoto, Mitsutoshi, 832  
 Tarbet, Bryon J., 812  
 Taylor, Nicholas J., 834  
 Tezuka, Yasuyuki, 840  
 Than, Chit, 763  
 Thomas, John M., 840  
 Todesco, Paolo E., 807  
 Tsai, Eric W., 771  
 Twyman, J. Mark, 786  
 Tyler, Ralph J., 766  
 Uda, Hisashi, 815  
 Uddong, Uko, 823  
 Vaccari, Angelo, 788  
 Verhé, Roland, 825  
 Walker, Neil M., 799  
 Watson, Ashley J., 763  
 Weber, Michael, 810  
 Wegman, Richard W., 820  
 Weller, Frank, 782  
 White, Donald, 840  
 Wong, Luet-Lok, 799  
 Wooster, Nicholas F., 840  
 Yamada, Jun-ichi, 802  
 Yamamoto, Yoshinori, 802  
 Yoneyama, Hiroshi, 779  
 Yoshiyasu, Kazuhiro, 801  
 Zhou, Wei-Shan, 791

# Two Essential Bulletins covering Laboratory and Chemical Industry Hazards . . .

**Laboratory Hazards Bulletin (LHB)** is a current awareness periodical providing invaluable information on safety measures, potential hazards and new legislation, affecting all those working in laboratories. Published monthly, each issue contains between 60-70 references drawn from current scientific and technical literature worldwide. The references include document titles, bibliographic citations and abstracts, plus contact address if necessary. Also included is a Hazards Data Sheet relating to a specific chemical compound.

**ISSN 0261 2917 1988 Subscription**  
**UK £90.00 USA \$169.00 Rest of World £104.00**



730 **Liquid nitrogen**

Lindsay, W. N. San Jose, CA, USA  
*Chem. Eng. News* 15 Jun 1987, **65** (24), 2.

This letter draws attention to the hazards of liquid nitrogen, with the present excitement about new compounds that become superconductors at liquid nitrogen temperatures. Liquid nitrogen, which boils at -195°C, will, if left exposed to air, condense oxygen, which boils at -183.0°C. The resulting liquid can have strong oxidizing properties, and in the presence of oil or other easily oxidized substances, may react violently. It is advised that Thermos bottles of liquid nitrogen are not left sitting around unused or uncovered.

**Chemical Hazards in Industry (CHI)** is a current awareness periodical providing comprehensive, up-to-date information on health and safety, hazards, plant safety, legislation, protective equipment and storage, relating to the chemical and allied industries. Each monthly issue contains approximately 300 references drawn from over 200 of the world's most important primary journals. Each reference includes document title, bibliographic details and abstract, plus contact address if necessary. Each issue contains chemical and subject indexes.

**ISSN 0265 5721 1988 Subscription**  
**UK £192.00 USA \$359.00 Rest of World £216.00**



**2921 Printed circuit board manufacture – fire.** *Fire Prev.* June 1987, (200), 38. A report is given of a fire at a printed circuit board manufacturer in Telford, Salop, on 28 Dec 1986. The probable cause was identified as ignition of solvent vapours by a heating element left on during the Xmas holidays.

*Don't be without these invaluable publications – write to us for further details and receive a sample issue free! Simply complete and return the slip below.*

- Please send me a free sample issue of LHB  
 Please send me a free sample issue of CHI

Name .....

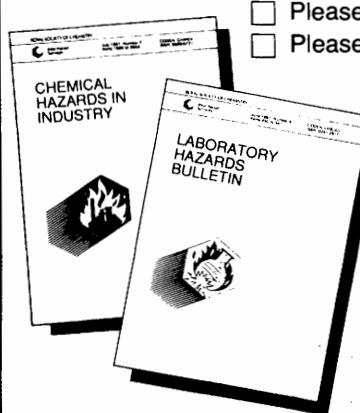
Position .....

Organisation .....

Address .....

.....

To order please phone (0602) 507411 quoting your credit card details – we now accept Access/Visa/Mastercard/Eurocard. Or write to the address below enclosing a cheque made payable to the Royal Society of Chemistry. We can also issue pro-forma invoices if required.



**Please return to:**

Alison Cowley, Royal Society of Chemistry  
The University, Nottingham NG7 2RD, United Kingdom