tisation poussée lors des expériences de longue durée, (4) simplifier au maximum l'utilisation.

L'adoption du principe de mise sous pression du container par chauffage a permis d'atteindre ces buts.

Dans le vase 'Dewar' de l'appareil Stöe sont plongées deux thermistances définissant des niveaux haut et bas, montées en série avec deux voyants (Fig. 1). Nous avons utilisé ces deux voyants comme détecteurs (pour une autre utilisation, il suffit d'adapter un autre système détecteur). Le voyant de niveau bas sert de sécurité générale. Sur le voyant de niveau haut, nous avons branché en parallèle deux relais identiques, l'un d'eux comportant une résistance additionnelle dans le circuit de bobine pour obtenir un léger retard par rapport à l'autre. Le premier commande le réchauffage du récipient donc la mise sous pression et le remplissage, le second coupe le chauffage et ouvre la vanne de remise à l'air du 'container'. La différence de niveau dépend donc de la résistance additionnelle et des performances du relais, c'est-à-dire de l'écart entre leurs tensions de coupure et de maintien. L'appareil étant sous pression, il suffit d'appuyer sur le poussoir *P* pour alimenter un relais de démarrage. Celui-ci court-circuite toutes les sécurités. Cependant, il ne peut fonctionner que si le niveau dans le réservoir est suffisant: il existe un circuit annexe comportant une jauge permettant de savoir à tout moment le niveau d'azote dans le 'container' et un relais coupant l'alimentation du relais de démarrage.

Si le niveau d'azote dans le 'container' est suffisant, l'appareil démarre: dans un premier stade, il y a mise sous pression pour remplir le 'Dewar' (le chauffage de celui-ci étant coupé); ensuite ce dernier étant plein, le relais de démarrage est court-circuité, le chauffage du Dewar' fonctionne et toutes les sécurités sont mises en place.

Dès qu'il n'y a plus d'azote dans le réservoir, son chauffage est coupé, et quand le niveau est trop bas dans le 'Dewar', l'ensemble s'arrête et la fenêtre du tube à rayons X se ferme.

Nous avons gardé la possibilité d'un fonctionnement manuel (par exemple lors du remplissage du 'container') grâce à l'inverseur *M–A*. En position manuelle, tous les circuits annexes sont éliminés sauf celui correspondant au niveau bas du 'Dewar'. Dans ce cas, il est évident qu'une fois l'appareil sous tension, il démarre en appuyant sur le poussoir *P* si le niveau est suffisant. Le chauffage dans le 'container' est assuré par une bobine en fil résistant compensé en température, fixée à l'extrémité de la canne de soutirage. Celle-ci comporte un fil résistant non compensé sur toute sa longueur pour le circuit de jauge. La canne de soutirage est un modèle classique de l'air liquide où le manomètre a été remplacé par les passages électriques, la valve de sécurité tarée très bas et où l'on a adapté la vanne sur la troisième voie.

La réalisation de l'ensemble a été voulue simple, peu onéreuse et accessible à tout manipulateur même non électronicien. Le module de commande a été inclus dans un générateur à rayons X du laboratoire. Il peut être adapté à n'importe quel autre problème d'alimentation continue en azote liquide en changeant uniquement les détecteurs.

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Observation of lead $L\alpha$ radiation from commercial X-ray tubes

In testing a newly purchased commercial X-ray tube with a chromium anode, we observed, in addition to the usual tungsten, iron, copper, and nickel impurity lines, a further line. Its wavelength, determined by diffraction from single crystals of zinc selenide and indium arsenide on a Picker four-circle diffractometer, coincided with the $L\alpha$ emission of lead (1·175 Å). This determination was confirmed by measuring the absorption by a number of foils, as well as by measuring the 311 Friedel pair of the non-centrosymmetric ZnSe whose unequal intensities coincided with those expected for this wavelength on the basis of interpolated values of the dispersion corrections.

While the intensity of this lead line was very low, the strong 444 reflexion from InAs produced a Pb $L\alpha$ peak of significant intensity compared to the rather weak 222 reflexion of Cr $K\alpha$. The relative intensities of these can be gauged from Fig. 1. Similar observations were made with

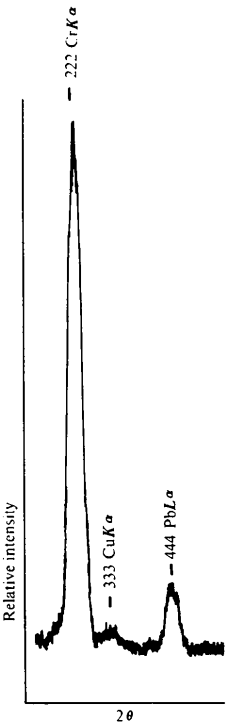

Fig. 1. Chart recording of the 222 reflexion of Cr $K\alpha$ and of the 444 reflexion of Pb $L\alpha$ by indium arsenide. The copper impurity line due to the 333 reflexion is also visible. The ratios of these wavelengths are such that all these reflexions occur at neighbouring Bragg angles.

ZnSe. Pulse-height discrimination eliminated the Pb $L\alpha$ line efficiently. In fact, it can be used as a calibration point for the pulse-height analyzer.

An even less intense Pb $L\alpha$ peak was recorded from a copper tube; none was observed from a molybdenum tube.

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Crystallographers

This section is intended to be a series of short paragraphs dealing with the activities of crystallographers, such as their changes of position, promotions, assumption of significant new duties, honours, etc. Items for inclusion, subject to the approval of the Editorial Board, should be sent to the Executive Secretary of the International Union of Crystallography (J. N. King, International Union of Crystallography, 13 White Friars, Chester CH1 1NZ, England).

Professor **J. F. Nye,** Professor of Physics at the University of Bristol, Dr **J. D. Smith**

of the Medical Research Council, Laboratory of Molecular Biology, Cambridge and Dr **M. J. Whelan,** Reader in the Physical Examination of Materials at the University of Oxford have been elected Fellows of the Royal Society.

Sir **James Menter**, Director of Research at Tube Investments Ltd., Hinxton Hall, England, has been appointed Principal of Queen Mary College, London University.

Professor **Richard S. Stein,** of the Department of Chemistry, University of Massachusetts, U.S.A., has been awarded the 1976 American Physical Society High Polymer Physics Prize, sponsored by the Ford Motor Company, for his pioneering optical and X-ray studies of structure and deformation in solid polymers under equilibrium and dynamic conditions.

William G. Pfann and **Henry C. Theuerer** of Bell Laboratories, Murray Hill, U.S.A., have been awarded the American Physical Society International Prize for New Materials, sponsored by IBM, for their outstanding work on the development of methods for the purification of semiconductors and the growth of epitaxic crystals from the vapour phase.

Dr **M. Hart,** a Co-editor of *Journal of Applied Crystallography* and at present at the H. H. Wills Physics Laboratory, University of Bristol, has been appointed Wheatstone Professor of Physics and Head of the Physics Department at Kings College, University of London, as from 1 October 1976. His new address is given on the inside front cover of this issue.

International Union of Crystallography

Report of the Tenth General Assembly and International Congress of Crystallography

The Report of the Tenth General Assembly and Congress has been published in *Acta Crystallographica*, Section A [*Acta Cryst.* (1976). A**32**, 691–745]. It includes the minutes of the General Assembly; the triennial reports of the Executive Committee, the Commissions and the Union representatives on bodies not belonging to the Union; the Statutes and By-Laws as amended by the Tenth Assembly; membership of the Executive Committee and the Commissions; names and addresses of Union representatives on other bodies; a list of Adhering Bodies and the membership of National Committees for Crystallography, with names and addresses of the Secretaries. Reprints of the report have been sent to Secretaries of National Committees.

World Directory of Crystallographers Fifth Edition

Biographical data for the Fifth Edition of the *World Directory of Crystallographers* are now being compiled in many countries. Each crystallographer in a country for which a national Sub-Editor has been appointed should have recently received a Data Input Form to complete. Anyone who has not received a Data Input Form should request one immediately from his Sub-Editor. A list of national Sub-Editors has been published in the July issue *Acta Cryst.* A**32**, pp. 745–747. Efforts are being made to contact crystallographers in all other countries: if not reached by 1 August 1976, they should write directly to the General Editor, Dr S. C. Abrahams, Bell Laboratories, Murray Hill, New Jersey 07974, U.S.A. Scientists with crystallographic colleagues in countries without Sub-Editors are requested to bring this notice to their attention.

The Fifth Edition of the *World Directory of Crystallographers* will be produced by computer-controlled photocomposition from punched cards prepared by the Sub-Editors. The resulting book is expected to be published by mid 1977, and to compare favourably with the Fourth Edition in appearance but at a substantially lower cost.

Book Reviews

Works intended for notice in this column should be sent direct to the Book-Review Editor (J. H. Robertson, School of Chemistry, University of Leeds, Leeds LS2 9JT, England). As far as practicable books will be reviewed in a country different from that of publication.

Real solids and radiation. By *A. E. Hughes* and *D. Pooley.* Pp. ix + 200. London: Wykeham (Wykeham Science Series), 1975. Price £3.00.

With the spreading of nuclear reactors the effects of radiation on the properties of materials has become a subject of interest to an increasing number of people. The paperback under consideration is written with the pupose to explain these effects in a very simple manner on a level accessible for high school students. The arguments used are mostly only qualitative, but they are clearly expressed having in mind that they should be intelligible for college students. As for the other volumes in this series the authors, who are experts in this field, are assisted by a schoolmaster to ensure that the correct level is maintained throughout the text.

The book contains all the required background information on solids and on radiation, starting from atomic structure, describing perfect solids and defects in crystals, and explaining their relation to physical properties. The interaction of different types of radiation with solids, leading to the creation of defects, is of course the main theme to which the major part of the book is devoted. The relevance of these considerations to technical problems is discussed as well.

This book can be recommended strongly as a first introduction to the subject; it completely meets the aim of the series to which it belongs.

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Fraktionierung der Spurenelemente bei der Kristallisation. By *H. E. Usdowski.* Pp. viii + 104. Berlin, New York: Springer-Verlag, 1975. Price DM 29.80, U.S. $12.90.

The book is written for students in mineralogy, crystallography, petrology and geochemistry in order to answer the question as to which factors can influence the concentrations of foreign elements that are present in trace quantities in the minerals of the earth's crust and in crystals in general.

The text starts with the derivation of the segregation coefficient as already given by Nernst in 1891, describing the equilibrium concentration of solute in neighbouring phases. Many consequences and examples are given, interesting both for chemists who have to purify or concentrate the minor component and for scientists of other disciplines who want to understand the segregation of impurities between different crystalline phases in sediments of various origins.

These aspects are treated in chapter V (segregation in laboratory and factory) and chapter VI (segregation in geological processes). The latter chapter describes