European Mineralogical Union

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THE EMU 2017 SCHOOL ON MINERAL FIBRES

The 2017 EMU (European Mineralogical Union) school entitled Mineral Fibres: Crystal Chemistry, Chemical–Physical Properties, Biological Interaction and Toxicity was held 19–23 June 2017 at the Chemistry and Earth Sciences Department UNIMORE in Modena (Italy). The school had been designed with a strong multidisciplinary slant, aimed at fully understanding both the nature and the biochemical activity of mineral fibres. The following topics were covered: crystal structure and crystallography, occurrence of mineral fibres and naturally occurring asbestos; experimental methods for the investigation of mineral fibres: optical microscopy, X-ray diffraction, electron microscopy, vibrational spectroscopy, iron spectroscopy and synchrotron radiation–based techniques; surface and bio-chemical properties of mineral fibres; in vitro and in vivo tests to assess cyto/genotoxicity and carcinogenicity of mineral fibres; epidemiological studies of asbestos-related diseases; genetic factors, mutations and toxicity of mineral fibres.

Quite a moment during Don Halterman's lecture on the optical properties of mineral fibres.

Attending the school were 80 participants and 15 lecturers. These came from many countries – Argentina, Australia, Canada, Croatia, France, Hungary, Italy, Norway, Slovakia, Slovenia, Spain, Switzerland, USA – and from backgrounds that spanned the university, public and private sectors. Many 'local' Italian lecturers (G. Andreozzi, P. Ballirano, E. Belluso, F. Belpoggi, G. Della Ventura, L. Fazzo, A. Gualtieri, A. Pacella, A. Pugnaloni, O. Sala, F. Turci and R. Vigliaturo) plus eminent international figures in the field of mineral fibres shared their knowledge and expertise. For example, Dr. Don Halterman (Occupational Safety and Health Administration, Salt Lake City, Utah, USA) explained the physical characteristics of mineral fibres. Dr. David Bernstein (toxicology consultant based in Geneva, Switzerland) gave a picture of the bio-chemical processes occurring after the inhalation of mineral fibres. Profs. Michele Carbone and Haining Yang (both from the University of Hawaii, USA) presented the results of their research (published in *Nature*) on BAP1 and MM cells. Dr. Bruce Case (McGill University, Canada) gave his lecture in remote mode. In addition, there were practical sessions in optical and electron microscopy and a field trip to a quarry containing asbestos in Borgotaro (Parma). Completing the programme was a visit to the Istituto Ramazzini (Bologna).

The school was sponsored by the International Union of Crystallography (IUCr), the European Mineralogical Union (EMU), the Italian Society of Mineralogy and Petrology (SIMP) and private sponsors.

The accompanying EMU Notes in Mineralogy book, *Mineral Fibres: Crystal Chemistry, Chemical–Physical Properties, Biological Interaction and Toxicity* (edited by A.F. Gualtieri), was released in time and gifted to all the attendees.

The short course received very positive feedback from the attendees. The lectures, photos and all the news that was related to the event are available at the web site http://emu2017.unimore.it/.

EMU NOTES IN MINERALOGY

Two new volumes have been published in the EMU Notes in Mineralogy series.

Volume 17 – *Redox-Reactive Minerals: Properties, Reactions and Applications in Natural Systems and Clean Technologies*

Minerals are naturally occurring inorganic solids that make up the solid part of most solar terrestrial planets. Redox-active elements such as iron, manganese, titanium and sulfur in these minerals allow them to engage in a wide range of electron-transfer reactions, including those mediated by biota or processes involved in palaeo-weathering and biogeochemical cycling. The importance of redox-reactive minerals in many natural and industrial processes has been demonstrated by a plethora of scientific publications and industrial applications in recent decades. In this book, the influence of redox-reactive minerals on key biogeochemical processes and the opportunities for their application in environmental technologies are outlined and illustrated in 14 comprehensive chapters. The book will be a key reference for Earth science students, geologists, geochemists and engineers and other researchers and practitioners in this rapidly growing interdisciplinary field.

The book is available from the Mineralogical Society online bookshop: www.minersoc.org (click on bookshop) at a price of £55 (institutions) and £40 for individuals (+ shipping). Copies are also available from the Mineralogical Society of America and from Amazon.

Volume 18 – *Mineral Fibres: Crystal Chemistry, Chemical-Physical Properties, Biological Interaction and Toxicity*

Asbestos is probably one of the most studied substances ever. Asbestos is synonymous with argument and controversy: it is magic but feared, essential but dreaded, a strategic natural raw material but a source of concern and hazard, it is banned but still used safely, and so the list goes on. Asbestos-related diseases are certainly of significant concern in terms of occupational and public health. Asbestos World Health Organisation officials estimate that 125,000,000 people worldwide are exposed annually to asbestos in occupational settings, and >100,000 people die annually of diseases associated with asbestos exposure. Use of asbestos has been banned in most developed countries, but chrysotile asbestos is still used in many developing countries. This book presents the state-of-the-art in the vast multidisciplinary research field of asbestos and of mineral fibres in general. The protagonists of the book are the mineral fibres with their immense complexity and poorly understood biochemical interactions. The approach of the chemist/mineralogist/crystallographer puts the fibre in focus, whereas the approach of the biochemist/toxicologist/doctor assumes the perspective of the organism interacting with the fibre. The perspectives of both the 'invader' and the 'invaded' must be considered together to establish a conclusive model to explain the toxicity of mineral fibres. In fact, this sharing of different perspectives and working in a multidisciplinary way is the key to understanding the mechanism of asbestos-induced carcinogenesis. With this in mind, the state-of-the-art in the field of mineral fibres is illustrated and discussed in this volume, with a multidisciplinary approach taking into account all the different scientific strands (biology, chemistry, epidemiology, mineralogy, physics, toxicology etc.). The different views have been considered in an attempt to assemble the pieces of the jigsaw and to present the reader with an up-to-date and complete picture.

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