

NORM V Symposium
UNIVERSIDAD DE SEVILLA
E.T.S. ARQUITECTURA
DEPARTAMENTO DE FÍSICA
APLICADA 2
Av. de la Reina Mercedes 4
E-41012 Sevilla, Spain



5th International Symposium on
Natural Occurring Radioactive
Material
March 19th – 22nd, 2007
SEVILLE, SPAIN
<http://www.congreso.us.es/normv>
e-mail: normv@us.es

FINAL PROGRAMME

Organized by:



in co-operation with



**5th International Symposium on Naturally Occurring Radioactive Material
NORM V**

**Seville, Spain, 19th- 22nd March 2007
Hotel Meliá Sevilla**

PROGRAMME

Sunday, 18th March

Evening

18.00 – 20.00: Registration (Hotel Meliá Sevilla)

20.00 – 21.00: Welcome Cocktail (Hotel Meliá Sevilla)

Monday, 19th March

Morning

8.45 - : Registration

9.30-10.00: Opening Ceremony

Opening Session

Chairmen: L. Ramos (Spain) and T. Ludwig (Germany)

10.00-10.40: **Plenary Lecture 1:** Managing Exposure to NORM — Consensus or Chaos? (*Denis Wymer, IAEA*).

10.40-11.10: Poster Session 1

11.10-11.40: *Coffee break*

Session A: Processing and Use of Thorium

Chairmen: L. Ramos (Spain) and T. Ludwig (Germany)

11.40-12.05: **Oral A1:** Thorium Applications in Spain (*M. Herranz et al., Spain*).

12.05-12.30 **Oral A2:** Radiation Exposure at Production and Use of Thoriated Gas Mantles (*T. Ludwig et al., Germany*).

12.30-12.55 **Oral A3:** Ecotoxicity of Thorium in Different Environmental Conditions (*I. Shtangeeva et al., Russia*).

12.55-14.00: *Lunch*

Session B: Processing and use of Zircon and Zirconia

Chairmen: A. Poffijn (Belgium) and N. Tsurikov (Australia)

14.00-14.40: **Plenary Lecture 2:** The Industrial Uses of Zircon and Zirconia, and the Radiological Consequences of these Uses (*J. H. Selby, South Africa*).

14.40-15.05: **Oral B1:** Radiological Assessment of Zircon and Associated Minerals Processing in Nigeria (*I. Funtua and S. Elegba, Nigeria*).

15.05-15.30 **Oral B2:** Radiological Impacts Associated with Zircon Sand Processing Plant in Brazil (*M. A. Pires do Rio et al., Brazil*).

15.30-16.00: Poster Session 2

16.00-16.30: *Coffee break*

16.30-16.55: **Oral B3:** Radioactivity Measurements Campaign on Ceramic Industries: Results and Comments (*V. Serradell et al., Spain*).

16.55-17.20: **Oral B4:** NORM in Italian Tiles and Refractories Industries (*G. Zampieri et al., Italy*).

17.20-17.45: **Oral B5:** Determination of Radon Specific Exhalation Rate from Italian Ceramic Tiles (*S. Righi et al., Italy*).

17.45-18.15 : Rapporteur Summary by C. Simmons (United States).

20.00- : *Social Event*

Session C: Production of Titanium Dioxide

Chairmen: A. Fahli (Morocco) and J. L. Martin Matarranz (Spain)

9.30-10.10: **Plenary Lecture 3:** Production of Titanium Dioxide (*Greg S. McNulty, United Kingdom*).

10.10-10.35: **Oral C1:** Radiological Implications due to Thorium in Titanium Mineral Separation and Chemical Processing (*P. P. Haridasan et al., India*).

10.35-11.05: Poster Session 3

11.05-11.30: *Coffee break*

Session D: Extraction and processing of rare earths

Chairmen: A. Fahli (Morocco) and J. L. Martin Matarranz (Spain)

11.30-12.10: **Plenary Lecture 4:** Naturally Occurring Radioactive Materials (NORM) in the Extraction and Processing of Rare Earths (*P. M. B. Pillai, India*).

12.10-12.35 **Oral D1:** The Deposition of NORM in the Processing of a Phosphate Ore Containing Rare Earths (*D. E. Collier and K. H. Soldenhoff, Australia*).

12.35-13.00 **Oral D2:** Lung types of Thoron Daughters in Monazite Storage Facility (*M. Zhukovsky et al., Russia*).

13.00-14.00: *Lunch*

Session E: Extraction, processing and use of phosphate minerals

Chairmen: J. Welbergen (The Netherlands) and B. P. Mazzilli (Brazil)

14.00-14.40: **Plenary Lecture 5:** Inhalation Doses and Regulatory Policy in Wet-Acid Processing of Sedimentary Phosphate Rock (*Brian Birky, The United States*).

14.40-15.05: **Oral E1:** Radioactivity in the Phosphate Field: Actions undertaken by IMPHOS (*T. Mrabet and M. M. Kotti, Morocco*).

15.05-15.30 **Oral E2:** Public Exposure from Mines Operating on an Igneous Ore Body (*A. J. van der Westhuizen, South Africa*).

15.30-16.00: Poster Session 4

16.00-16.30: *Coffee break*

16.30-16.55: **Oral E3:** Towards a Management and Regulatory Strategy for Phosphoric Acid and Phosphogypsum as Co-products (*J. Hilton, United Kingdom*).

16.55-17.20: **Oral E4:** Radiological Assessment of the Agriculture Use of Phosphogypsum in SW Spain. Results of a Three-year Field Experiment. (*J. M. Abril et al., Spain*).

17.20-17.45: **Oral E5:** Redissolution of ²²⁶Ra from Sediments in a Spanish Estuary Affected by the Phosphate Industry: Model Comparisons in the Frame of the IAEA EMRAS Project (*R. Periañez et al., International Collaboration*).

17.45 - 18.15: Rapporteur Summary by Anselmo S. Paschoa (Brazil).

20.00- : *Social Event*

SESSION F: Recycling of contaminated scrap. Waste Management

Chairmen : U. Quade (Germany) and A. J. van der Westhuizen (South-Africa)

9.30-10.10: **Plenary Lecture 6:** Radiological Control of Metal Scrap: “The Spanish Protocol” (*A. Rodriguez, Spain*).

10.10-10.35: **Oral F1:** Estimation of Personal Dose while Processing NORM-Contaminated Metal Scrap (*R. Kreh, Germany, and S. Dewji, Canada*).

10.35-11.05: Poster Session 5

11.05-11.35: *Coffee break*

11.35-12.00: **Oral F2:** A Study Concerning NORM in Integrated Steelworks (*F. Trotti et al., Italy*).

12.00-12.25 **Oral F3:** Radiological Impact Assessment for Landfill Disposal of NORM Wastes in Malaysia (*K. M. Kontol et al., Malaysia*).

12.25-12.50 **Oral F4:** Treatment of NORM Residues in the Netherlands (*J. Welbergen and R. Wiegers, The Netherlands*).

12.50-14.00: *Lunch*

Session G: Miscellaneous 1

Chairmen: S. Chalupnik (Poland) and D. Cancio (Spain)

14.00-14.25: **Oral G1:** NORM Measurements in the Oil and Gas Industry in Argentina (*Analia Canoba et al., Argentina*).

14.25-14.50: **Oral G2:** Radioactivity in Produced Water from Oil and Gas Installations- Doses to Biota and Man (*T. Ramsøy et al., Norway*).

14.50-15.15 **Oral G3:** Investigation of NORM Activities in Sweden- Dose Estimations to Workers and Public (*A.L.Söderman et al., Sweden*).

15.15-15.45: Poster Session 6

15.45-16.15: *Coffee break*

16.15- 16.40: **Oral G4:** Exposure and Radiation Protection for Working Areas with Enhanced Natural Radioactivity (*J. Döring et al., Germany*).

16.40-17.05: **Oral G5:** Status of Natural Occurring Radionuclides in Copper Mine Wasterwater in *Zambia* (*R. Katebe et al., Zambia*).

17.05-17.30: **Oral G6:** The Revision of the EURATOM Basic Safety Standards with Regard to Natural Radiation Sources (*A. Wiklund et al., European Commission*).

17.30 - 18.00 : Rapporteur Summary by J. van der Steen (The Netherlands).

20:00- : *Conference Dinner*

SESSION H: Miscellaneous 2

Chairmen: R. Wieggers (The Netherlands) and V. Koukoulidou (Greece)

9.30-9.55 : **Oral H1:** The Trade in Radioactive Materials- Potential Problems and Possible Solutions (*N. Tsurikov, Australia*).

9.55-10.20 : **Oral H2:** Measurement of Surface Contamination According to Legal Requirements (*R. Barthel and C. Bunzmann, Germany*).

10.20-10.45 : **Oral H3:** Environmental Impact of Radioactivity in Waste From Coal and Alumina Industry in Western Balkan Countries (*J. Klerkx et al., International Collaboration*).

10.45-11.15: Poster Session 7

11.15-11.45: *Coffee break*

11.45-12.10: **Oral H4:** The Dependence of Radon Emanation from Red Mud on Heat Treatment (*V. Jobbágy et al., Hungary*).

12.10-12.35: **Oral H5:** Chemical Types of Bonding of Natural Radionuclides in Technologically Enhanced Naturally Occurring Radioactive Materials (TENORM) (*K. Leopold and J. Wiegand, Germany*).

12.35-13.00: **Oral H6:** A Radiological Investigation of Columbite-Tantalite (Coltan) Mining by Artisans in the Eastern Congo (DRC) (*A .O. Mustapha et al., Kenya*).

13.00-13.30: Summary rapporteur by P. Shaw (United Kingdom).

13.30: Closing

POSTER SESSION 1: MONDAY MORNING

Poster 1-1: Development of a European ALARA Network for NORM
H.Schulz et al., Germany

Poster 1-2: Assessment of TENORM Sources in Slovenia
B. Smodis et al., Slovenia

Poster 1-3: REDRADNA: The Spanish network on Natural Radiation
L.Quindós et al., Spain

Poster 1-4: Regulatory aspects on NORM/TENORM Activities in Malaysia
I.L.Ten, Malaysia

Poster 1-5: State of the art of the problems of NORM in Ukraine
B.Zlobenko, Ukraine

Poster 1-6: Hygienic Regulations of NORM Materials Management in Ukraine
Y.Soroka et al., Ukraine

Poster 1-7: Occupational and Public Exposure due to naturally occurring radioactive materials (NORM) activities in France
N.Pires et al., France

Poster 1-8: Recording of legacies in the German raw phosphate processing
A. Reichelt and J. Gerler, Germany

POSTER SESSION 2: MONDAY AFTERNOON

Poster 2-1: Removal of Uranium and Thorium from Zircon through Sulfuric Acid Medium Curing

M.Cipriani et al., Brazil

Poster 2-2: Evaluation of Occupational Exposure to Naturally Occurring Radioactive Materials (NORM) in the Iranian Ceramics Industry

N.Fathabadi et al., Iran

Poster 2-3: A method to evaluate direct gamma-spectrometric measurements of NORM samples

J.Mantero et al., Spain

Poster 2-4: Determination of Radon Concentration in Soil Gas by Gamma-ray Spectrometry

D.Al-Azmi and N.Karunaka, Kuwait

Poster 2-5: Improvements in the Liquid Scintillation Techniques for the Measurement of NORM samples

F.Mosqueda et al., Spain

Poster 2-6: Development of a Radon-Aerosol System for testing radon Decay Products Measuring Instrument

M. Calamosca et al., Italy

Poster 2-7: Chemical Separation and Preconcentration for Lanthanum in Monazite using Non-Destructive Gamma ray Spectrometry

N.S.Awwad et al., Egypt

Poster 2.8: Estimation of the Radiological Risk Related to the Presence of Radon-222 in a Hydrotherapy Centre of Tunisia

F. Essafi et al., Tunisia

Poster 2-9: Natural Radioactivity of Building Material in South-Africa

I.Low and A. Faanhof, South-Africa

POSTER SESSION 3: TUESDAY MORNING

Poster 3-1: Radiological Impact of a Coal-Fired Power Station in Spain

A.Baeza et al., Spain

Poster 3-2: Integrated Assessment of Possible Detrimental Effects caused by NORM

B.Michalik, Poland

Poster 3-3: Fractionation of ^{226}Ra and ^{228}Ra in waste materials of coal mines and fired power plants and the effect of speciation on plant uptake

E.Bokori et al., Hungary

Poster 3-4: Natural radioactivity status in mining settling ponds: Bioaccumulation of Radium in biota and the derived dose

G.Trabidou et al., Greece

Poster 3-5: Bioindication-based Approach on Integrated Assessment of Natural Radionuclides Impact on Biota in Post-Mining Areas

S.Geras'kin et al., Russia

Poster 3-6: New underground treatment installation for radium removal

S. Chalupnik et al., Poland

Poster 3-7: Availability of radium isotopes and heavy metals from scales and tailings of Polish hard coal mining

K.Leopold and B. Michalik., Germany

Poster 3-8: Substantiation and Control of Natural Radionuclide Discharges produced by Mine "Novaja" into River Ingulets

M.Buzziny et al., Ukraine

POSTER SESSION 4: TUESDAY AFTERNOON

Poster 4-1: Estimates of the Occupational Exposure to TENORM in the Phosphoric Acid Plant in Iran

N.Fathabadi et al., Iran

Poster 4-2: Occupational Exposures in a Fertiliser Industry located at Huelva (South-western Spain).

J.P.Bolivar et al., Spain

Poster 4-3: Studies on the size distribution of some natural (^{210}Pb , ^{210}Po , ^{238}U and ^{234}U) radionuclides in air particulate matter collected in the vicinity of phosphate fertilizer and the coal-fired power plants in Poland

B.Skwarcez et al., Poland

Poster 4-4: Phosphogypsum as building and construction material in tropical countries – radiological implications

V.M.Jacomino et al., Brazil

Poster 4-5: Remediation Interventions in Italian industrial sites contaminated with NORM from the phosphate industry: law provisions, criteria and methods.

M. Paganini et al., Italy

Poster 4-6: Collective dose for the Netherlands and Belgium from an elemental phosphorous plant: assessment on the ingestion dose from contaminated farmland, and influence of the weather

C.Tanzi and H.Eleved, The Netherlands

Poster 4-7: Dispersion of Radionuclides Through the Ebro river Lower Course Ecosystem Beyond the Flix Reservoir

N.Casacuberta et al., Spain

Poster 4-8: Radium and uranium isotopes in Spanish phosphogypsum leachates

J.L.Aguado et al., Spain

POSTER SESSION 5: WEDNESDAY MORNING

Poster 5-1: Conceptual Use of NORM as Primary Shielding for Radioactive Wastes
A.S.Paschoa et al., Brazil

Poster 5-2: Identification of NORM industries at the entrance of a steel factory
L.Quindós et al., Spain

Poster 5-3: NORM Radiological Control of wastes produced by a steel Recycling factory in the South of Spain
J.Mantero et al., Spain

Poster 5-4: NORM in Drinking Water, Removal and Radioactive Waste Generated
F.Schönhoffer, Austria

Poster 5-5: Radiochemical Characterisation of the Sludge from a Treatment Plant of Potable Water
M.Palomo et al., Spain

Poster 5-6: Microbiota occurrence in different TENORM wastes
P. Shaba and J. Konyi, Zambia

Poster 5-7: NORM waste disposed in underground salt mine
J.Dörfel, Germany

Poster 5-8: NORM residues as a Result of Earlier Mining and Processing of Nb in Norway
T. Strand et al., Norway

Poster 5-9: Distribution of naturally-occurring radionuclides (U, Th) in Tilmahdit Black shale (Morocco)
G.Galindo et al., Morocco

POSTER SESSION 6: WEDNESDAY AFTERNOON

Poster 6-1: Activity Ratios of Natural Radionuclides as Markers of Changes in the Policy of NORM Wastes Released by Industries Located at the South of Spain
E.G.San Miguel et al., Spain

Poster 6-2: Modelling NORM in the environment: the EMRAS project
R.S.O'Brien et al., International Collaboration

Poster 6-3: Dicalcium Phosphate in Poultry Livestock Feed Supplements: Contents of Uranium Decay Series and its Potential Effects to the Human Diet
N.Casacuberta et al., Spain

Poster 6-4: Sequential determination of U and Th isotopes and Ra-226 by alpha spectrometry in phosphate fertilizers and phosphogypsum
C.H.R.Saueia et al., Brazil

Poster 6-5: Characterisation and modelling of naturally occurring radioactive material releases from a phosphogypsum disposal area in Greece
D.Perez et al., Spain

Poster 6-6: Estimation of the amount of anthropogenic uranium in 112 Japanese agricultural soils due to application of phosphatic fertilizers
S.Uchida and K. Tagami, Japan

Poster 6-7: Radioactive Levels, Thorium and Uranium contents in three Brazilian phosphates used in agriculture: Triple, Mono-ammonium (MAP) and Dicalcium (DCP)
A. Canella Avellar et al., Brazil

Poster 6-8: Natural radioactivity components in solid waste produced in the manufacture of phosphatic fertilizer
X.Ortega et al., Spain

Poster 6-9: ^{238}U and ^{226}Ra uptake by *industrial tomatoes* in a plant pot array experiment with phosphogypsum-amended soils.
S. Enamorado et al., Spain

POSTER SESSION 7: THURSDAY MORNING

Poster 7-1: Rapid methods for the determination of natural radionuclides in waste waters from a phosphogypsum waste repository site

M.Forte et al., Italy

Poster 7-2: Extensive Rn-222 exhalation measurements in phosphogypsum stacks from SW Spain using charcoal canisters

J.M.Abril et al., Spain

Poster 7-3: Radon generation as a consequence of fertilizer's management and production

L.Quindós et al., Spain

Poster 7-4: Gamma Spectrometry of Israeli and Brazilian Phosphates used in Agriculture: Considerations of the exposure of the workforce involved

A. Canella Avellar et al., Brazil

Poster 7-5: Radiation Exposure due to Agricultural Uses of Phosphate Fertilizers in Saudi Arabia

A.E: M Khater et al., Egypt

Poster 7-6: Radium-226 transfer factors for various crop samples collected in Japan

K.Tagami and S. Uchida, Japan

Poster 7-7: Identification of Technogenic Contamination by Natural Radionuclides

I.V. Yamoshenko et al., Russia

Poster 7-8: Radon Levels at a NORM storage site

L.Saueia and M. Pires Campos, Brazil

Poster 7-9: Fluxes and Enhancement of Natural Radionuclides in a Pulp Mill Factory Located in the South-West of Spain

F.Vaca et al., Spain