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Foreword

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LSC2017, an International Conference on Advances in Liquid Scintillation Spectrometry (http://lsc2017.nutech.dtu.dk/), is the 23rd edition of the LSC series conferences, which started in 1957 in Chicago (USA), and has in more recent years taken place at Karlsruhe (Germany) 2001, Katowice (Poland) 2005, Davos (Switzerland) 2008, Paris (France) 2010 and Barcelona (Spain) 2013. This is the first time this series of conferences was held in Nordic countries. The LSC2017 conference was organized by Technical University of Denmark, Center for Nuclear Technologies (DTU, Nutech) in cooperation with IAEA (International Atomic Energy Organization), SSM (Sweden), Helsinki University (Finland) and IFE (Norway). The conference was held in Copenhagen during 30 April–5 May 2017.

Liquid scintillation spectrometry (LSC) is an important radiometric technique for measurement of radionuclides. Compared to the newly developed techniques, such as accelerator mass spectrometry and ICP-MS, LSC technique has been developed for more than 60 years and considered a traditional and mature technique. However, it is still a competitive technique for the measurement of many radionuclides, especially short-lived ones, low-energy beta emitters and decay by electron capture, even alpha emitters, such as ^{3}H, ^{55}Fe, ^{63}Ni, ^{89}Sr, ^{90}Sr, ^{222}Rn, ^{241}Pu, etc. The LSC technique is still widely used not only in the nuclear science but also many other fields, such as environment, geology, archeology, biology, chemistry, etc. The development and improvement in the LSC instrumentation and methodology are continued in the recent years. Some remarkable progress on the LSC methodology has been achieved, and new version of LSC instruments with ultra-low background and high sample capacity up to 250 ml become commercially available. In particular, the triple-to-double coincidence ratio (TDCR) based LSC method and instruments, although this technique has been realized many years ago, but the commercialized LSC instrument have obtained a great success in the recent years. The tedious quench correction and counting efficiency calibration in the conventional LSC measurement can be avoided, and even absolute measurement of radionuclide activity using LSC becomes realistic with this instrument. In addition, plastic scintillator based technique was rapidly developed in the recent years, which can avoid the production of the liquid organic scintillator, but still use the ordinary LSC instrument for measurement. The application of LSC techniques is constantly increasing, indicated by the increasing LSC instruments installation and research publications. Besides the major application in environmental radioactivity and radio-pharmaceutics, its application for the detection of neutrons and neutrinos was also well recognized. Meanwhile, there are still some challenges in the LSC methodology and its application in some research fields, which will drive this technique to be developed further. The LSC conference is the only conference specifically dedicated to the methodology and application of this technique, and provide a unique platform in presentation, demonstration and discussion of all aspects related to the LSC.

We aimed to cover all aspects of the methodology and application of LSC, the experts in different areas were invited to organize sessions: New development on LSC instrumentation, methodology, scintillators and spectrum analysis by Dr. Philippe Cassette and Dr. Jean Aupiais

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(CEA, France); Radionuclide metrology using LSC, standardization and quality assurance by Dr. Karsten Kossert (PTB, Germany) and Dr. Brian E. Zimmerman (NIST, USA); LSC applications in environmental radioactivity by Mr. Aurelien Pitois (IAEA) and prof. Gabriele Wallner (Vienna Univ. Austria); LSC application in neutrino and neutron detection by Dr. Xiongxin Dai (CIRP, China); LSC application in nuclear chemistry (decommission, waste process and nuclear materials) by Dr. Nora Vajda (RADANAL, Hungary) and prof. Phil Warwick (Southampton Univ. UK); Plastic scintillator and application by prof. Jose F. Garcia and Dr. Alex Tarancon (Barcelona Univ., Spain); LSC application in tritium studies by Dr. Nicolas Baglan (CEA, France); LSC application in medicine and other topics by prof. Mikael Jensen (DTU, Denmark) and LSC application in natural radionuclides measurement by Dr. Siegurd Möbius (KIT, Germany). I would like to thank them and other international scientific

Fig. 1 Conference participants' photo

Fig. 2 Presentation of the conference

committee members including Dr. Jost Eikenberg (PSI, Switzerland), prof. Chunli Liu (Peking Univ., China), Dr. Steffen Happel (Triskem, France), prof. Timothy Jull (Univ. Arizona, USA), Dr. Mun Ja Kang (KAERI, Korea) and prof. Wangsuo Wu (Lanzhou Univ., China) for their great support in the organization of the conference.

We received 185 abstracts in total, after reviewed by the scientific committee 176 abstracts were selected for

Fig. 3 Winners of the best poster awards in LSC2017 conference

Fig. 4 Local organizers

presentation, 13 invited lecture and 65 oral and 98 poster presentations. In addition, there were 7 exhibitors who displayed their products related to the LSC technique. A total of 191 participants and 15 accompany persons attended LSC2017, making it the largest one in this series of conferences in the past 20 years. Photos of the participants and their presence in the lecture room are shown in Figs. 1 and 2, respectively.

Six best posters were selected by the LSC2017 evaluation committee consisting of Dr. Brian Zimmerman, Prof. Jerzy-Wojtek Mietelski, and Prof. Susanta Kumar Lahiri, they were awarded to Fumiyuki Hiyama (Tohoku University, Japan), Benoit Sabot (CEA/LNE-LNHB, France), Ivana Stojkovic (University of Novi Sad, Serbia), Masanori Koshimizu (Tohoku University, Japan), Mirela Vasile (SCK-CEN, Belgium) and Zeyi Yan (Lanzhou University, China) in the closing ceremony (Fig. 3).

In this issue, 35 papers presented in the conference are accepted after the peer review process. These papers cover almost all aspects of the methodology and application of LSC. Many invited lecturers submitted full papers of their talk, including a paper by prof. Jose F. Garcia that gives a comprehensive review on the plastic scintillators.

I would like to express my appreciation for the support of DTU Nutech, SSM and IAEA. Two workshops were organized during the conference, one on TDCR triple coincidence detector by Hidex and another on advances in Ultra low-level detection by PerkinElmer. I appreciates their contributions and support to the conference.

Grateful thanks are also expressed to the local organization committee members and my colleagues in DTU Nutech (Fig. 4): Dr. Jens-Peter Lynov, Dr. Dennis Ringkjøbing Elema, Dr. Sven P. Nielsen, Dr. Jixin Qiao, Dr. Per Roos, Dr. Kasper Andersson, Dr. Mats Eriksson, Mr. Nikola Markovic, Dr. Szaboics Osvath, Ms. Yvonne Hinrichsen, Dr. Gunnar Jacobs, Dr. Shaobo Sun, Dr. Luyuan Zhang, and Dr. Yukun Fan for their hard and productive work in the preparation and organization of LSC2017. I want to specially thank the conference secretaries Ms. Helle Tofte Holm and Ms.Birgitte Sindholt; they gave a huge effort in the organization of the conference.

Lastly, I would like to thank all participants and sponsors for their contributions to the conference. Meanwhile, I would like to encourage all readers to attend the LSC2020 conference which will be held in Chengdu, China in 2020.

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professor Chairman of LSC2017 conference
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