Special Seminar:
Source term research in HTR-10: Tritium and Carbon-14

Speaker:
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Abstract
The Very High Temperature Reactor (VHTR) is a Generation IV reactor concept. The 10MW high temperature gas-cooled reactor (HTR-10) is a helium cooled, graphite-moderated, and thermal neutron spectrum reactor. Tritium (H-3) and Carbon-14 (C-14) contribute to the radiation source term for VHTRs, and have received increasing attention for the environmental impact assessment of HTR-10. Recently, several experiments on source terms in HTR-10 have been carried on, including the investigation of radioactive graphite dust, H-3, and C-14 in the primary loop, the decomposition and measurement of activation products in the post-irradiation graphite sphere from the core, and others. In this talk, the recent experimental progress on H-3 and C-14 in HTR-10 will be introduced. The production mechanism, distribution characteristics, reduction route, and release type of H-3 and C-14 in HTR-10 will be discussed. The talk will also introduce the design of the process and effluent radiation monitoring system of HTR-PM, which is based on the source term research on HTR-10 and the experience learned from Arbeitsgemeinschaft Versuchsreaktor (AVR) and pressurized water reactors (PWRs).

Short Biography
Dr. Feng Xie is an Associate Professor at the Institute of Nuclear and New Energy Technology (INET) of Tsinghua University, Beijing, China. His research interests include the radiation safety of the high temperature gas-cooled reactors (HTGRs), the behavior of fission and activation products and radioactive dust in HTGRs, and atomic molecular physics. He is in charge of the design and implementation of the radioactive graphite dust experimental system of HTR-10, the experimental measurement of the Tritium and Carbon-14 in the primary loop of HTR-10 and in the post-irradiation graphite spheres from the core of HTR-10, and the design of the process and effluent radiation monitoring system of HTR-PM in China.

He received his bachelor’s degree and Ph. D. in 2003 and 2008 from the department of Physics in Tsinghua University, respectively. In 2008, he joined as a research assistant professor in Temple University, Philadelphia, USA. In 2011, after two-year postdoctoral fellow in Tsinghua University, he assumed his current position in INET of Tsinghua University. He has published more than 40 papers in scientific journals and international conference proceedings, including J. Chem. Phys. and Chem. Phys. Lett., and is an inventon on two patents.

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