

IMF 10 Editorial Note

Over the last 12 years specialists devoting work on inert matrix fuel (IMF) have met exchanging their samples, data or modeling results and sharing activities in projects such as calculations or irradiations. At the 10th-IMF workshop it was important to focus on new orientations on the basis of the last 10 years activities.

The inert matrix fuel workshop has a long tradition in presenting, discussing and publishing innovations and research in the IMF field. The Inert Matrix Fuel workshop has always attracted both experimentalists and computational researchers. The topics that are addressed are the development of inert matrix fuels and targets and the behaviour of the reactors loaded with these materials.

The first IMF workshop was thus held at PSI, Switzerland on 20 September 1995 with 12 participants from four institutions of three countries, Italy, Japan and Switzerland. It built the basis of the IMF activities in the field of IMF reactor sciences and IMF material sciences.

After the first IMF workshop, nine workshops were held in Switzerland, Italy, France, The Netherlands and Japan. The numbers of the participants and the papers presented in the workshop increased year by year, and in the fourth workshop, also at PSI, on 19–20 October 1998, was held before the OECD/NEA ARWIF workshop. The IMF workshop was successfully held with 64 participants from 11 countries and one international organization. After that, the sixth IMF workshop was held as a session of European Materials Research Society 2000 Spring Meeting at Strasbourg on 30 May to 2 June 2000. In nine workshops held before 2003, total of more than 450 participants have taken part from 17 countries, Australia, Belgium, Canada, Czech Republic, France, Germany, India, Israel, Italy, Japan, Korea, The Netherlands, Russia, Sweden, Switzerland, UK and USA, and three international organizations, EC, IAEA and OECD.

The IMF workshop covers not only plutonium utilization but also minor actinides transmutation, materials both as a fuel and as a target in reactors (thermal and fast) and accelerator driven systems. The topics of the workshop ranges in the materials study such as basic thermal properties, fuel fabrications, compatibilities, fuel behaviour under ion irradiation and in-pile irradiation, and in the physics study such as benchmark calculations on data and method, physics experiments, core and assembly design and safety analyses. In the early IMF workshops until around fourth, the discussion on the physics benchmark calculations was very active, while the results of irradiation tests are becoming available to be the important subject in the recent workshops.

Since the fourth workshop, the proceedings were published in a journal every two years. The proceedings of the fourth IMF workshop were published as a special issue of *Journal of Nuclear Materials*: Volume 274. The sixth workshop proceedings were published in *Progress in Nuclear Energy*: Volume 38, and the proceedings of the eighth workshop are published in *Journal of Nuclear Materials*: Volume 319. Total of 111 papers have been published in these three journals.

The IMF10 workshop was embedded this year in the Symposium N ‘Nuclear Materials’ of the EMRS Spring meeting 05 at the Palais des Congrès in Strasbourg. It was held 1–2 June, 2005. The workshop concerned the last IMF results obtained so far in the groups as well as the activities starting for example in

the US in the frame of the AFC program. The goal remains to utilize plutonium and the minor actinide in a economical, ecological, sustainable and safe way.

The workshop was introduced by Claude Degueldre (PSI) summarising the 10 years history of the initiative followed by Chaitanyamoy Ganguly (IAEA) addressing the IMF challenges. The 10th IMF workshop was held for two days and two sessions were held in the areas of IMF neutronics or reactor science and IMF material science. The first session was chaired by Vitaly Sobolev (SCK. CEN) and Masaki Saito (TIT) and concerned the IMF neutronic and reactor sciences. Six papers were presented, ranging from IMF in LWR to IMF in ADS. The session was followed by a panel discussion introduced by Jon Carmack (INL) and focusing on IMF future. During this presentation the INL representative invited the IMF participant to IMF11, which will be held at Park City Utah, 10–12 October, 2006. The second session concerned IMF Material Science and was chaired by Marco Streit (ATEL) and Rory Kennedy (INEL). In addition, two IMF posters were presented within the poster session.

A number of 60 participants from 15 countries participated to the workshop and a total of 25 presentations were held. In this *Journal of Nuclear material* issue 16 papers are presented.

Today, spinel is no longer considered, while zirconia may be found good for specific application. It requires some attention when used as full IMF core. On the other hand considerable attention has been devoted for low temperature IMF over the last few years.

The IMF research focused initially on Pu burning. Today activities concern Pu and MA utilization as fuel and burnable (fertile) poison. On the other hand attention is drawn for materials for high damage (very high burn-up) and high temperature (HTR) utilization.

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