



## Preface

Session 6 of the 7th International Symposium on Molten Salts Chemistry and Technology (MS7), named *Nuclear Energy and Nuclear Wastes* was run as an International Workshop within the symposium. The organisers of the workshop were Jim Willit of *Argonne National Laboratory* (ANL) from the USA, Jean-Paul Glatz of the *Institute of TransUranians* (ITU) from the European Community, Sylvie Delpech of the *Laboratory of Electrochemistry and Analytical Chemistry* (LECA) from Paris VI University, France and Pierre Taxil of the *Laboratory of Chemical Engineering* (LGC) from Toulouse III University, France.

As expected by the organizers, the attendance by the international scientific community working on the nuclear field was high and representative of the main research organisations and laboratories in the world involved in the field.

The Workshop was held over one and half days during the symposium; the session was ended by a round table animated by Jim Willit and Jean-Paul Glatz.

The discussions during the round table were somewhat emotional but and highly interesting, as pointed out by many of the participants after the end of the congress in e-mails sent to the organizers.

The oral communications were selected in such a way that all recent aspects of nuclear activities were dealt with in the relevant sessions of the workshop. Each session was introduced by a 30-minute keynote lecture from an international specialist in the subject covered by the session.

The structure of the special issue follows the day-to-day timing of the workshop: general and strategic articles (1–3) followed by technical and scientific papers (4–10).

The articles in the first part deal with the economic relevance of new generation nuclear reactors, using molten salts as a fuel mixture and also as cooling agent which suggests the requirement for online waste treatment and thus the design of looped recycling reactors. The thorium cycle in this generation of reactors is presented as a promising route and reprocessing using the pyrochemical alternative is now preferred to the Purex process, based on liquid extraction no longer operative in a recycling reactor.

The use of molten fluorides and chlorides, now considered as the best candidates both for nuclear fuel and cooling fluid, requires exhaustive knowledge of their thermodynamic and electrochemical properties, investigated in articles 4–6, while a spectroscopic study of the speciation of elements dissolved in these salts during reprocessing is covered in article 7. Finally, articles 8–10 deal with reprocessing techniques using reductive electrochemical or chemical extraction.

To conclude, this special issue of JNM devoted to the nuclear workshop of MS7 expresses all the concerns of the nuclear industry for the new generation of reactors which should be operative in the next half-century and produce the majority of the energy required by the planet, while respecting the notions of sustained development and clean processes, now governed by environmental laws.

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