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**Irradiation Capsules with Suspended LEU UO₂ Particles
for ⁹⁹Mo Production**

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ABSTRACT

Capsules, with suspended spherical particles of uranium (LEU) dioxide in water, are being developed to be used as high thermal neutron flux irradiation targets in research reactors to produce ⁹⁹Mo from ²³⁵U fission.

Particles are maintained in suspension by external agitation and water radiolysis equilibrium recombination pressure is reduced with hydrogen incorporation. Micron size fused spherical UO₂ particles will be produced in a induction couple plasma equipment.

Out of pile experiments were performed to collect ⁹⁹Mo in solution, separate it from adsorbed surfaces and wash the particles for a next cycle of irradiation. Experiments in thermal neutron beams and in the proximities of the nuclear core of research reactors are being designed.

One of the interests in this system is that the size of the particles is smaller than the penetration depth in UO₂ of the fission products, and hitherto the particles can be used several irradiation cycles without need of reprocessing them. Nuclear residues are drastically reduced.