

## NEUTRON ACTIVATION AND QUALITY CONTROL OF AZER SPHERE

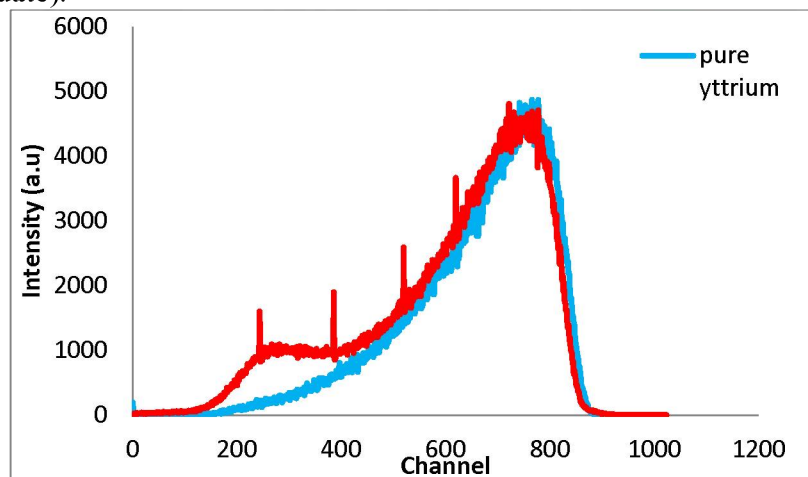
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Neutron activation and quality control of Y-90 microspheres produced at Azerbaijan national academy of science (Azer spheres) was the purpose of this study.

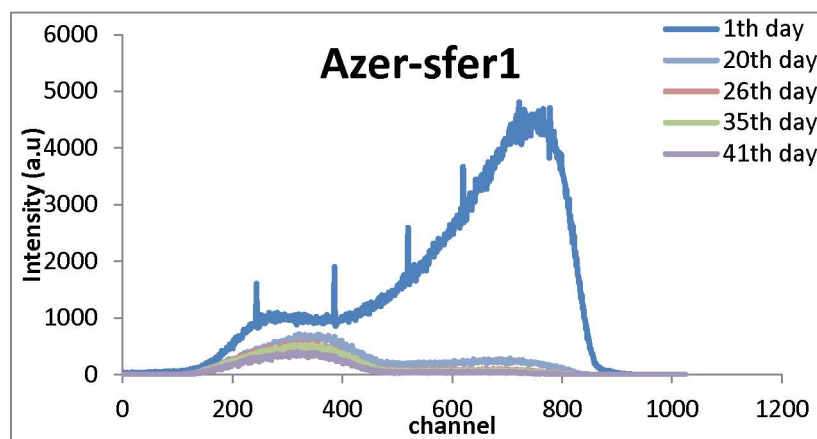
In total, 200 mg of microsphere powder was poured into a quartz ampoule (6 cm in height, 0.7 cm in diameter), which was sealed with an oxygen flame. The sample was irradiated inside a sealed aluminum container (7 cm in height, 3 cm in diameter) for 10 hours in the reactor. The medium neutron flux was approximately  $3.0 \cdot 10^{13} \text{ n/(s.cm}^2\text{)}$ .

After cooling (3 days), the sample was cut, and the quartz ampoule was crushed to measure the activity of the sample with a curimeter (Atomlab™ 400 Dose Calibrator). The activity was approximately 60 mCi. Subsequently, the  $^{90}\text{Y}$  microspheres were added to a 10-ml vial to form an elution with 5 ml of saline. The  $^{90}\text{Y}$  microspheres were then analyzed with a gamma spectrometry system and an ultra-low-level liquid scintillation spectrometer to determine the following parameters:

- Radiochemical purity of free  $^{90}\text{Y}$  (percentage of free  $^{90}\text{Y}$  chemical species in the eluate) through ascending paper chromatography,
- Radionuclide purity (presence of gamma emitting radionuclides in the  $^{90}\text{Y}$  microspheres of the eluate).



Beta spectrum of pure Y-90 and azer sphere



Beta spectrum of azer sphere at different time