Contribution ID: **983** Type: **Verbal**

Metal-organic frameworks as adsorbent for the 99Mo/99mTc generator

Tuesday, 17 May 2022 11:10 (20 minutes)

This work explored the potential of several metal-organic frameworks (MOFs) as adsorbents for the development of 99Mo/99mTc generator using 99Mo produced by neutron capture of 98Mo which is hampered by its low specific activity. The molybdenum adsorption performance of MOFs, including adsorption kinetics and isotherms, were determined and adsorption mechanism was studied by several analytical techniques such as X-ray photoelectron spectroscopy, Raman spectroscopy, zeta potential and density functional theory calculation. The results showed that the maximum adsorption capacity of UiO-66 (Ce) can reach up to 475 mg/g at pH 3. The high surface area and defects appear to increase adsorption sites, enhancing the affinity between the UiO-66 and the molybdenum ions by Zr-O-Mo coordination, anion-π as well as hydrogen bonds. To achieve a clinical application, the performance of 99Mo/99mTc generator fabricated with the most promising MOFs was evaluated. The results demonstrated that 90% of 99mTc can be eluted with acceptable cerium breakthrough. The obtained excellent separation performance demonstrates that MOFs are good candidates as adsorbents for 99Mo/99mTc generator and should be explored more extensively in the future.

Primary author: MA, Chao

Co-authors: Prof. WOLTERBEEK, Hubert; Prof. DENKOVA, Antonia; Dr SERRA CRESPO, Pablo

Presenter: MA, Chao

Session Classification: Radionuclides Production & Application

Track Classification: Production and Application of Radionuclides