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Density modified tracer particles for Positron Emission Particle Tracking (PEPT)

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PEPT Cape Town has established the development of Gallium-68 based tracer particle analogues for use in positron emission particle tracking studies of granular and multiphase systems. The accuracy of the measured data relies strongly on how representative the tracer particle analogue is to the media of interest in these dynamic systems. The ability to control and manipulate the tracer particle properties expands the range of applications and systems suitable for investigation with PEPT. The density of the material represented by the analogue is often a critical parameter of the system under study. Tracer production methods developed at PEPT Cape Town rely on multiple layers of coatings on tracers created by radiolabelling ion exchange resin beads. The layers include the radioactive core, a density-controlled region and may include an additional coating used to control the surface chemistry of the particle. The current available densities range between 1.00 and 2.85 g cm-3 with final particle diameters as small as 450 microns. We report on our methods for creating density-modified tracer particles and illustrate their application in PEPT measurements from an industrial system designed to separate higher density minerals from lower density gangue.

Apply to be considered for a student ; award (Yes / No)?

No

Level for award;(Hons, MSc, PhD, N/A)?

N/A

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