



Contribution ID: 386

Type: Oral

Measurements of Radiotracer Residence Time Distribution Using a Flow Rig in Kenya

Friday, 28 April 2017 12:35 (20 minutes)

The Kenya Bureau of Standards (KEBS) in partnership with IAEA has set up a Radiotracer Data Analysis measurements facility using a flow rig under Project RAF/0/004 : Cleaner and safer management of industrial. The purpose of the facility is to promote the radiotracer RTD method extensively to industries, in order to optimize processes, solve industrial problems, improve product quality, save energy and reduce pollution. The radiotracer methodology includes the accurate measurement of the residence time distribution (RTD) and its utilization for troubleshooting and diagnosis. The process involve injecting a compatible radiotracer into an appropriate inlet upstream of the flow rig vessel and monitoring its passage through, therefore allowing RTD of fluid to be measured. Sensitive radiation detectors of scintillation nature, are placed at strategic elevations and locations on the flow rig. The scintillation detectors are used because they are relatively small and easy to mount at each position. Each scintillation detector are connected by a cable to a central data logging device that records radiotracer concentration versus time information. The data acquisition system ensures collection, treatment and visualization of the data . When the radiotracer passes each detector a response is registered and recorded. Before the investigation, each detector is assessed and its response normalized so that each detector responds identically to a given unit of radiotracer. The flow rig consists of a tank with four stirrers, a pump flowing the water inside the rig, two flow meters for measuring flow rates in two different branches, several two and three way valves for regulating the flow direction and regime, two injection points, pipes and ion exchange resin column for trapping the radiotracer after a test. Radiotracer used is Tc-99m with relatively low activity for each test. From the results, different flow patterns are then simulated using flow rig. The investigation performed are dead volume measurement, by-pass measurement, determination of residence time distribution (RTD) measurements that include parallel flow measurements, re-circulation experiment, pump mixing and flow rate. The important feature and benefit radiotracer above conventional methods is that measurements can be carried out while a plant is on-line, with no disruption to operating processes. PRESENTER

COLLINS OMONDI,
KENYA BUREAU OF STANDARDS,
RADIOTRACER LABORATORY,
cyallar@kebs.org / collinsyallar@yahoo.co.uk

Country/Organization invited to participate

Kenya

Primary author: Mr OMONDI, Collins (Kenya Bureau of Standards, Kenya)

Co-author: Mr OTWOMA, David (Nation Commision for Science Technology and Innovation, Kenya)

Presenter: Mr OMONDI, Collins (Kenya Bureau of Standards, Kenya)

Session Classification: B16

Track Classification: RADIATION TECHNOLOGIES FOR MEASUREMENT