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A study of hydrodynamics in gas evolving reactions

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Uka Oguh graduated with an MEng degree in Chemical Engineering in 2007, from the University of Birmingham. He opted to continue in academia after developing an interest in the metal extraction / leaching of metals and its interplay with fluid hydrodynamics.

In August of 2007 he commenced his research as an EngD Research Engineer in Johnson Matthey looking into the process optimisation of leaching processes.

The current objective of his project is to look at the suspension of gas evolving solid-liquid reacting phases in a stirred vessel. Such an occurrence can be found in the leaching and oxidation of ferrous ores, which leads to the production of leach residue (solid particulate matter) and evolved gas, as well as catalytic dehydrogenation reactions such as aromatisation. They are many others.

Within the industry, the scale up of gas evolving systems such as these is carried out based on data and the understanding obtained from gas-sparged systems. Gas-sparged systems present a simplification of the hydrodynamic phenomena within processes such as these.

This ideal has often been further exaggerated by the use of smooth spherical objects such as glass beads, whereas in real processes the objects could be highly porous. Thus, it is envisaged that there could be some inefficiencies in terms of excessive energy use and increased wear and tear in the vessels.

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