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Mass Transfer in Reactor with Magnetic Field Generator

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Abstract : The growing interest in magnetic fields applications is visible due to the increased number of articles on this topic published in the last few years. In this study, the influence of various magnetic fields (MF) on the mass transfer process was examined. To carry out the prototype set-up equipped with an MF generator that is able to generate a pulsed magnetic field (PMF), oscillating magnetic field (OMF), rotating magnetic field (RMF) and static magnetic field (SMF) was used. To demonstrate the effect of MF's on mass transfer, the calcium carbonate precipitation process was selected. To the vessel with attached conductometric probes and placed inside the generator, specific doses of calcium chloride and sodium carbonate were added. Electrical conductivity changes of the mixture inside the vessel were measured over time until equilibrium was established. Measurements were conducted for various MF strengths and concentrations of added chemical compounds. Obtained results were analyzed, which allowed to creation of mathematical correlation models showing the influence of MF's on the studied process.

Keywords : mass transfer, oscillating magnetic field, rotating magnetic field, static magnetic field
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