

THE DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING SPEAKER SERIES

PRESENTS

Degradable Materials for Multi-Stage Stimulation



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Room W122, Engineering Building 2

LECTURE ABSTRACT

Degradable materials are being used extensively for multistage stimulation as fluid diverting agents or structural components of degradable plug-and-perf systems. This presentation gives a brief overview of multi-stage stimulation technologies for enhancing the productivity of ultralow-permeability formations. It reviews degradable materials (including degradable plastics and elastomers and degradable magnesium and aluminum alloys) being used in multi-stage stimulation, compares their degradation mechanisms, and discusses the factors that affect their degradation behaviors.

Examples will be given to show how key parameters—material formulation, temperature and hydrostatic pressure—affect the degradation behaviors of a few proprietary degradable materials. Comprehensive testing was done to verify the performance of these proprietary materials under simulated downhole conditions. Models were built to predict the degradation time windows of the degradable materials under a broad range of downhole conditions for better completions job planning. Field operation results validate the performance of degradable multi-stage stimulation products.

Degradable materials are garnering more and more attention in the multistage stimulation market and even more rapid growth in their application is expected in the coming years.

SPEAKER BIOSKETCH

Dr. Huilin Tu is a principal project manager working in Schlumberger. She joined Schlumberger in August 2006. Dr. Tu has received her Ph.D. in Materials Science and Engineering from the University of Illinois at Urbana-Champaign and her M.S. and B.S. with honors in Chemistry from Peking University (China). Her main research and development interests include functional materials such as degradable materials, swellable elastomers, and high temperature polymers, and downhole completions tools such as degradable fracturing plugs and high-temperature high-pressure packers. She authored 17 peer-reviewed papers and invented 10 granted patents and 10 patent applications.