

# Surface Enhanced Raman Spectroscopy For Nanoparticle Catalysts

The use of catalysts in the chemical industry is common in the production process. However how these catalysts work exactly is not always known. The research group of Prof. Prashant Jain is using surface enhanced micro Raman spectroscopy (SERS) to examine the exact mechanisms of an Ag nano particle catalyst for chemical formation of ethylene.

SERS gives the researchers a detailed look what chemical processes happen during the catalytic reaction. In the experiment a single Ag nanoparticle is observed spectroscopically. A 300m focal length SpectraPro spectrometer with a Pylon camera record the Raman spectra. The SERS observations show that the formation of graphene happens as a first step during the chemical process. Knowledge of the precise reaction steps then allowed the team to design a new combined graphene/Ag nanoparticle catalyst which enables the chemical process under ambient conditions using photoexcitation whereas the typical reaction scheme requires cost intensive high pressure and high temperature environments.

The team hopes to that their newly designed reaction will be used to optimize other catalytic reactions commonly used.

**Featured Paper/Publication:** [In situ formation of catalytically active graphene in ethylene photo-epoxidation](#), Nature Communications, 2018

**Reference Lab:** [Prashant Jain, University of Illinois Urbana-Champaign, USA](#)

**Featured Product:** [HRS](#), [Isoplane](#), [PIXIS](#), [BLAZE](#), [Pylon](#)