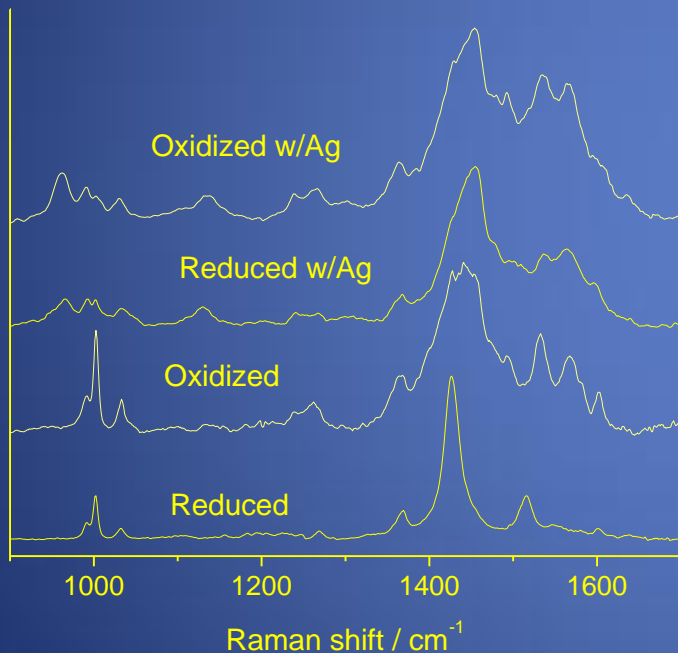


Metal nanoparticle enhancement of organic polymer solar cell efficiency: Raman and optical studies

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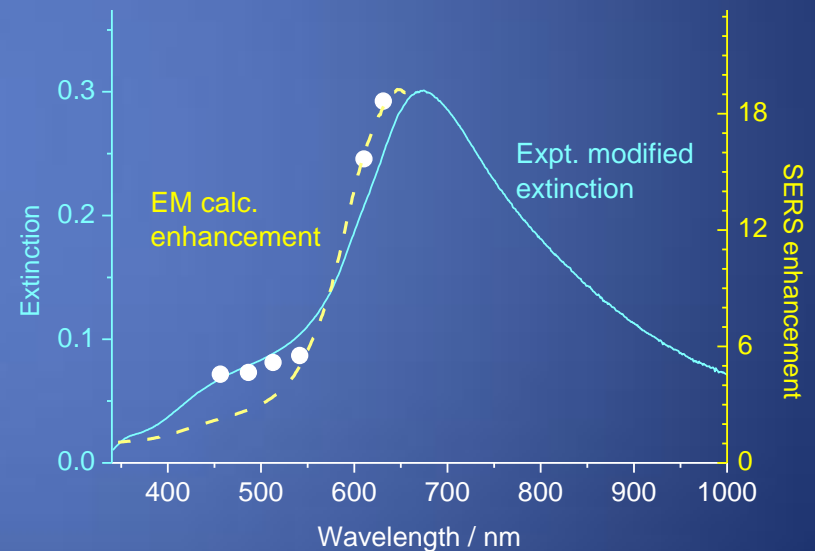
Goal: Use surface enhanced Raman scattering (SERS) to probe how plasmonically active gold and silver nanoparticles enhance power conversion efficiency in organic polymer based solar photovoltaics.

1. *PEDOT:PSS* A transparent polymer blend used to improve hole transport at the cathode.



SERS spectra show that Ag nanoparticles re-oxidize chemically reduced PEDOT to its as-received reduced form. Suggests Ag may offer protection against photoreduction of PEDOT.

2. *P3HT:PCBM* A conducting polymer/fullerene blend that absorbs light, generates and conducts charges.



SERS spectra show no chemical changes. SERS enhancements closely follow electromagnetic theory, suggesting solar power enhancement is largely a plasmonic effect on electromagnetic field.