

# Poster Presentations

## [MS33-P06] Structural changes in acrylamide and methacrylamide under high pressure

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High-pressure chemistry is an area of growing interest for many reasons. For example, exerting high pressures on a substance may allow a phase transition to a polymorph not seen under ambient conditions; these different forms may possess very different properties which are influenced by the crystal structure.[1] An advantage of high pressure techniques is the ability to carry out reactions in the absence of any solvent, or with minimal quantities thereof, which appeals to the notion of green chemistry.[2] Previous work by the group investigated the polymorphism and polymerization of acrylic acid and methacrylic acid under high pressure conditions.[3] This study showed that both molecules undergo phase transitions at high pressure to new polymorphs. To continue our study into polymorphism and polymerization at high pressure, we have embarked upon the study of their amine derivatives. Acrylamide and methacrylamide have both been studied at pressures of up to 8 GPa via Raman spectroscopy and X-ray diffraction. Studies of acrylamide via Raman spectroscopy indicated three phase transitions, which have been confirmed via powder X-ray diffraction. Forms 1 and 2 of methacrylamide have been studied at high pressure through both compression and high-pressure recrystallization techniques. Initial studies of methacrylamide under high pressure indicate a previously unseen third form being obtained via recrystallization at 0.4 GPa. The effect of these polymorphs on polymerization product will also be discussed.