Synthesis and Characterization of Mo$_2$GaC, Mo$_2$GaN and Mo$_2$AlC MAX Phases

Daniel Vryhof

max.materials.drexel.edu

MAX phases:
Machinable ternary carbides with a unique combination of ceramic and metal properties.

MXene:
Two-dimensional carbide flakes derived from MAX phases with the A group element etched away.

Key Results:
- 211 MAX phase of Mo$_2$GaC synthesized, only the second time in history that this material has been produced.
- Mo$_2$C MXene synthesized.
- Mo$_3$GaC$_2$ MAX phase observed, a novel phase.
- Pure phase of Mo$_3$Al$_2$C synthesized.

Impact:
- Mo$_2$C MXene has potential to be a favorable electrode material for energy storage in devices such as lithium-ion batteries or supercapacitors.
- New MAX phases synthesized for future MXene research.
- Mo$_2$C MXene synthesized.

Contact: Dr. Michel Barsoum
Materials Science & Engineering
E-mail: barsoumw@drexel.edu
Phone: (215) 895-2338