Nanostructured Chevrel Phase for Magnesium Battery Cathodes

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The case for magnesium

- Second only to lithium in specific charge
- Advantages over lithium
  - More abundant
  - Less hazardous to the environment
- Magnesium challenges
  - Divalent cation

Nanostructured Materials

- Decreased diffusion length
- Faster charge/discharge

	Li	Mg
Cation valence	+1	+2
Atomic weight (g/mol)	6.94	24.31
Ionic radii (nm)	0.068	0.065
Specific charge (A h/kg)	3862	2205
Electrode potential (V)	-3.05	-2.38
Terrestrial abundance (%)	0.006	1.94

Chem. Phys. Chem. 3 (2002), p. 155-159

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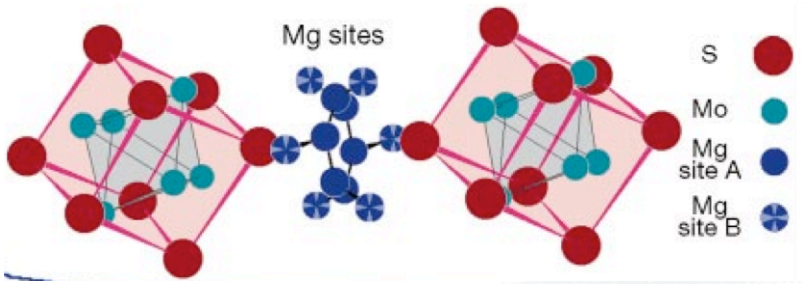
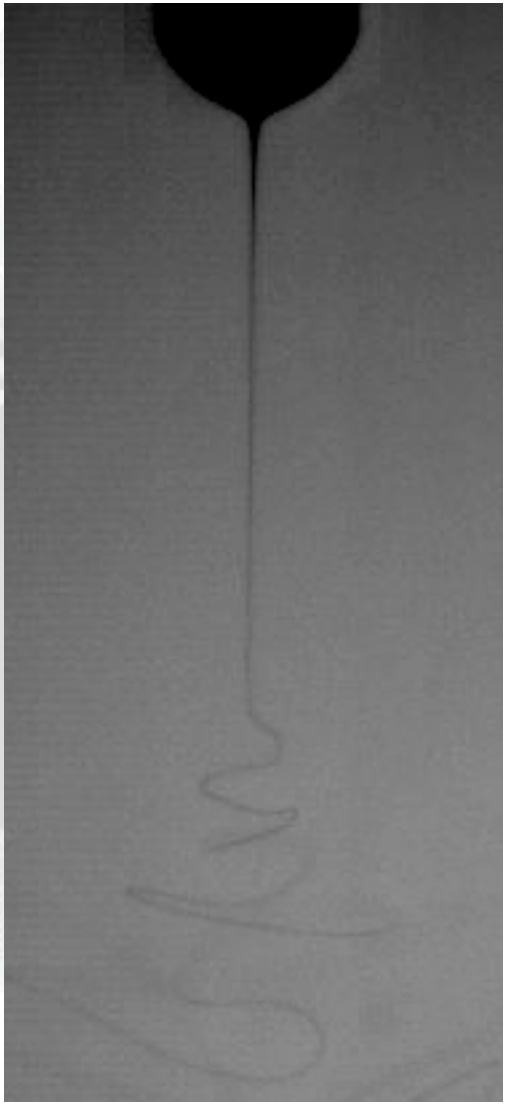


Approach

- Magnesium Chevrel phase material
  - $Mg_2Mo_6S_8$
- Electrospinning
  - Green fibers produced through electrohydrodynamic phenomenon
  - Further size reduction during calcination
  - Submicron sized fibers with grains that are tens of nanometers in diameter



Solid State Ionics, 179 (2008), p. 742-751.