

Simulant Name: MGS-1 Mars Global Simulant

Simulant Type: General purpose

Reference Material: Rocknest soil

Uncompressed Bulk Density: 1.29 g/cm³

Mean Particle Size: 90 μm

Median Particle Size: 60 μm

Particle Size Range: >0.04 μm – 600 μm

Publication: Cannon et al. 2019, Icarus 317, 470-478



Mineralogy

As mixed.

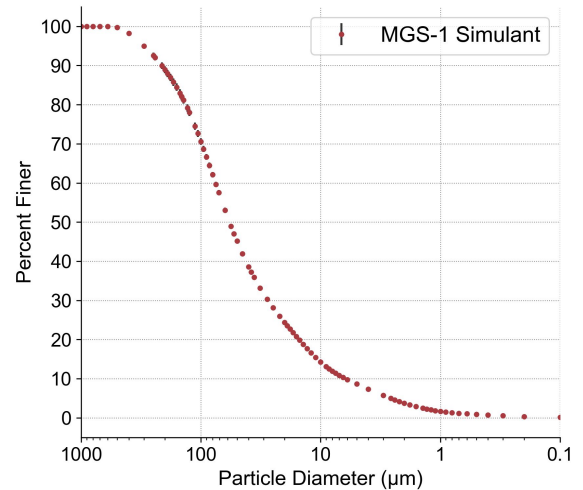
Component	Wt.%
Anorthosite	27.1
Glass-rich basalt	22.9
Pyroxene	20.3
Olivine	13.7
Mg- sulfate	4.0
Ferrihydrite	3.5
Hydrated silica	3.0
Magnetite	1.9
Anhydrite	1.7
Fe-carbonate	1.4
Hematite	0.5

Bulk Chemistry

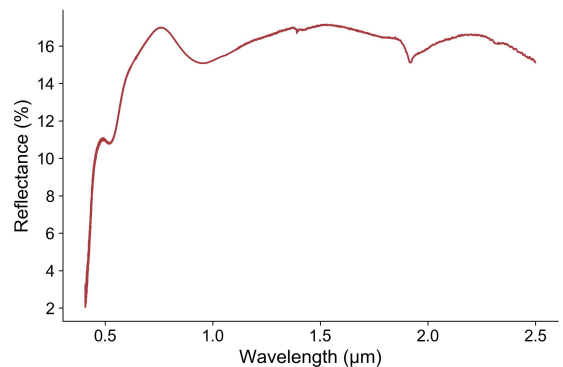
Measured by XRF.

Oxide	Wt.%
SiO ₂	45.2
TiO ₂	0.4
Al ₂ O ₃	14.9
Cr ₂ O ₃	0.2
Fe ₂ O ₃	18.7
NiO	0.2
MnO	0.1
MgO	7.6
CaO	10
K ₂ O	0.6
P ₂ O ₅	0.9
SO ₃	0.9
Cl	0.4
SrO	0.1
Total	100.0

Particle Size Distribution



FTIR Spectrum



Safety

See SDS for details. Primary hazard is dust inhalation; wear a respirator in dusty conditions.

Photo credit Matthew Villegas. FTIR spectrum courtesy of Katerina Slavicinska, Bennett Lab, UCF.