

Transcript:

Hi, I'm David Bish, co-investigator on the CheMin instrument on the Mars Science Laboratory and this is your Curiosity rover update.

We've been spending some time in an area called Rocknest, and this week we delivered a scoop of a dune to Curiosity.

CheMin performs what we call X-ray diffraction measurements on powdered rocks and soil samples. An X-ray diffraction is the best method for telling us what minerals are present in a rock or a soil because it is sensitive to the arrangements of atoms in minerals. As the X-rays strike the soil sample, CheMin shows us how mineral crystals distinctively interact with X-rays, and this image shows our first X-ray diffraction results. The diffraction signals appear on the detector as rings that represent the fingerprint of the individual minerals. The rings tell us not only what minerals are present in the soil but also how abundant they are.

The CheMin data provide us with distinctive signatures of the minerals: plagioclase feldspar, pyroxenes, and olivine. Peridot is a variety of olivine; just keep in mind that the olivine in the soil sample is much smaller than these crystals. Roughly half of the soil consists of poorly crystalline material, such as volcanic glass. Thus, this Martian soil appears very similar to some weathered basaltic soils that we see on Earth, in places like the flanks of Mauna Kea, Hawaii.

You can appreciate how revolutionary CheMin is when you consider that instruments of this type on Earth are typically about the size of a double-wide refrigerator and the CheMin instrument on the Mars Science Laboratory is about the size of a shoebox. CheMin has been modified for use on Earth in places such as Antarctica and the Arctic.

It's also been applied for the detection of counterfeit pharmaceuticals around the world and a modification of the instrument has been used in archeological studies to help us understand the nature of the surfaces and how we might protect them.

In the coming weeks and months, we're excited to measure more X-ray diffraction data on soils and rocks to tell us much more about the geology of Gale Crater.

This has been your Curiosity rover report. Stay tuned for further updates.