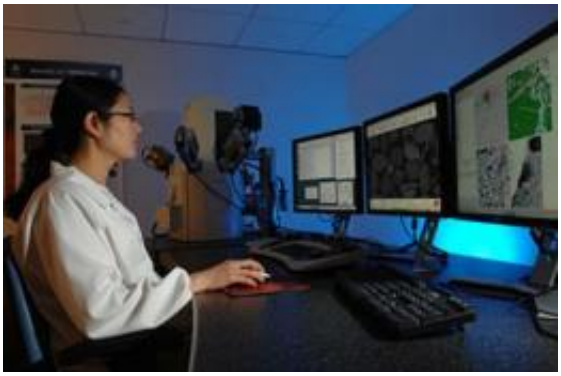
New analyzers to unlock mineral value

October 6 2009



This is Sophia Morrell with the QEMSCAN unit at CSIRO's Australian Minerals Research Centre, in Waterford, Western Australia. Credit: Darryl Peroni

Scientists are working on a new range of materials characterisation analysers and techniques that could help unlock the value contained in Australia's mineral deposits and improve processing performance, according to the October issue of *Process*.

Machine-mounted sensors, being developed through CSIRO Minerals Down Under Flagship, could help locate ore deposits, characterise the mining environment, and differentiate ore grades.

This will enable automated mining machines to respond 'intelligently' to the changing detail of the environment and offer real-time amendments to the mine plan.

Another prototype in development combines the best features of two existing materials characterisation techniques - x-ray diffraction and x-ray fluorescence - into a new slurry analyser.

The new prototype, dubbed XRDF for its dual origins, is capable of measuring both mineralogy and ultra-low elemental composition directly on a process-stream, without the need for labour-intensive, time-consuming and potentially error-prone sampling.

CSIRO scientist Dr James Tickner said the new prototype could offer a number of benefits over existing on-stream analysers.

"We're not aware of any other system capable of doing accurate, on-stream mineralogy," Dr Tickner said.

"The ability to detect elements at parts-per-billion levels in an on-stream system is unique."

Dr Tickner and his team are also working on gamma-activation analysis - a new analysis method that may deliver all the benefits of neutron activation without the need for a nuclear reactor.

The method is expected to provide accurate, multi-element analysis of mineral samples without extensive sample preparation, and measure very low levels of more than 30 elements in samples weighing just a few hundred grams.

The method could significantly improve sampling accuracy.

More information: A pdf of the magazine is available now at: www.csiro.au/resources/Process-Oct-09.html

Source: CSIRO Australia