Beyond 'blood diamonds:' Fingerprinting other conflict minerals

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Blood diamonds may get the most attention. But they are not the only minerals sold on the world market to finance wars and other conflicts in sub-Saharan Africa, according to an article in the current issue of *Chemical & Engineering News* (C&EN), the weekly newsmagazine of the American Chemical Society, the world's largest scientific society.

The story, by C&EN Senior Editor Celia Henry Arnaud, focuses on minerals being mined in the Democratic Republic of the Congo (DRC) and sold to underwrite political militias there that ruthlessly injure and kill civilians. Metals made from these mineral ores are used in aerospace, electronics, light bulbs and other technologies. A federal law passed in 2010 forbids companies from buying the minerals cassiterite, columbite-tantalite, wolframite and gold from sources in the DRC and nine neighboring countries. The article focuses on the development of "fingerprinting" technology these companies badly need to ensure that they are using conflict-free minerals.

Arnaud highlights one approach that uses a laser to blast trace elements off these ores for analysis. She explains that as molten rock moves through the Earth's crust, it picks up small amounts of elements that can later be used to identify the origin of mineral ores. This laser induced breakdown spectroscopy (LIBS) analysis, developed by Richard R. Hark, Ph.D., of Juniata College in Huntingdon, Pa., uses so-called "rare-earth" elements as identifying markers to locate precisely the source of ores immediately after they are mined. Arnaud notes that further work is needed to make rugged instruments that can be carried to the mines

themselves and to build a database of mineral fingerprints to check suspect ores.

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