



Pyrite nanoparticles exploding out of deep-sea vents help feed iron-craving deep-ocean creatures.

Bacteria and plankton hungry for iron in the deep ocean can't just pop over to the nearest pharmacy to buy a multivitamin or dig into a juicy steak. Instead, new research shows that they may be getting their daily allowance of iron from pyrite (FeS_2 nanoparticles delivered over long distances after erupting from hydrothermal vents (*Nat. Geosci.*, DOI: 10.1038/ngeo1148). In the past, researchers believed that a majority of the iron bursting out of these deep-sea vents would immediately precipitate nearby as the hot vent fluid mixed with cold seawater. Biogeochemists subsequently discovered that some hydrothermal vent iron remained dissolved and was transported farther from the vents than expected. A team led by George W. Luther III and Mustafa Yiicel of the University of Delaware now report that hydrothermal vents are "nanofactories" that produce stable pyrite nanoparticles up to 200 nm wide. Formed before erupting from vents, the nanoparticles remain suspended and slowly oxidize to release iron for deep-sea creatures farther afield. This incarnation of pyrite, also known as fool's gold for its deceptively shiny yellow appearance, appears to be priceless to the ocean food chain, the researchers say.