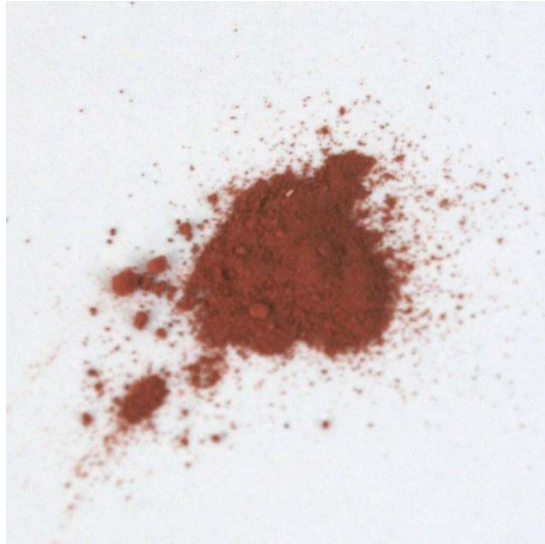


## Recovery of radioactive cesium from incinerated sewage sludge ash

### Paving the way for disposal of incinerated sludge ash containing radioactive materials

The research group of Dr. Toshihiko Ohnuki of Advanced Science Research Center, the Japan Atomic Energy Agency (JAEA), has succeeded in recovering more than 90% of radioactive cesium from incinerated sewage sludge ash by dissolving the ash in hydrochloric acid after pulverization. The application of this technology enables the appreciable volume reduction of incinerated sludge ash.

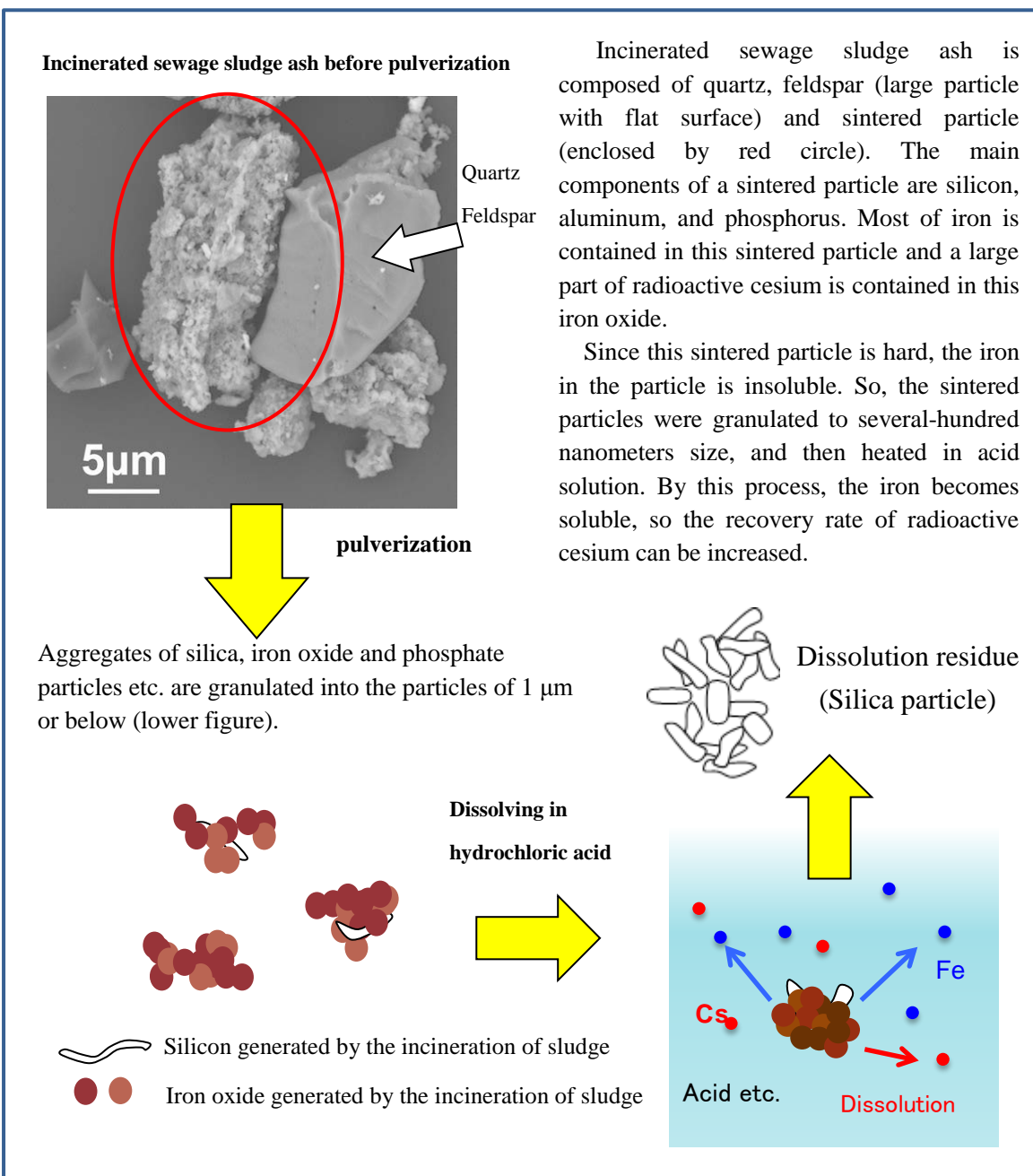


After the accident of the Fukushima Daiichi Nuclear Power Station, some of the incinerated ash (photo above) that was produced by the treatment of sewage sludge contains radioactive cesium. Among this, the ash containing radioactive cesium higher than 8,000 Becquerel per one kilogram is now stored in regional sewage disposal plants as the designated waste.

As one of the methods to eliminate radioactive cesium from the above-mentioned waste, it is examined to dissolve the incinerated ash in organic acid or nitric acid. However, not all of the radioactive cesium in the ash is dissolved in acid solution, so the low recovering rate of radioactive cesium has been a problem to be solved.

Under these circumstances, the research group of Dr. Ohnuki analyzed the concentration of elements such as radioactive cesium and iron dissolved in acid solution. They found that radioactive cesium is mainly contained in iron oxides, and a part of the iron oxides is not dissolved in acid solution because it is covered with silicate minerals. Accordingly, they pulverized the ash down to several-hundred nanometer (one nanometer: one billionth of one meter), and then dissolved in hydrochloric acid. As a result, they succeeded in recovering more than 90% of radioactive cesium, while the maximum recovery had been only 70% without pulverization. Also they confirmed that no radioactive cesium is dissolved into solution even when the dissolution residues were immersed in pure water or sea water.

By applying this method, more than 90% of radioactive cesium can be recovered from incinerated sludge ash, resulting in the reduction of the radioactivity level in the ash less than 8,000 Becquerel per one kilogram, the standard value of radioactive cesium for the designated waste. This leads to the further volume reduction of designated radioactive wastes. The present results were obtained in the laboratory. So, there still remain many problems to be solved, such as the development of methods to reuse solution for dissolving more efficiently. From now on, JAEA will continue to develop the system for the waste disposal of incinerated sewage ash by pulverization process, in cooperation with private enterprises and research organizations.



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