

# Chemist: I Can Clean Fukushima Water Faster

French nuclear engineering company Areva SA will lend its services to treat the pools of radioactive water at the troubled Fukushima Daiichi nuclear power plant, lifting a crucial obstacle hindering repair efforts. But a Japanese chemist claims he has developed a powder substance in less than a month that he says could decontaminate the toxic water 20 times faster than the French method, thereby significantly accelerating progress toward the ultimate goal of cold shutdown.



Nuclear and Industrial Safety Agency/Reuters

A worker wearing protective suit points at his rubber boots to show the level of water being submerged at the second basement floor of the crippled Fukushima Daiichi nuclear power plant on April 8.

Tomihisa Ohta, a professor at Kanazawa University's graduate school of natural science and technology, says his white powder, made up of an assortment of natural minerals and chemicals, would essentially capture the radioactive materials from the contaminated water in a process that could treat 1,000 tons of water in an hour. Areva's treatment system can remove radioactive material from 50 tons of water an hour.



Courtesy of Tomihisa Ohta

The powder developed by chemist Tomihisa Ohta and Kumaken Kougyou Co.

"It's just that we're using an extremely fast method," said Mr. Ohta in an interview with JRT Wednesday. "The precipitation speed is different." Mr. Ohta said he developed his technology in conjunction with Kumaken Kougyou Co., a pollution cleanup company in Akita Prefecture. Kumaken Kougyou has been using powder developed by Mr. Ohta developed since about 2008.



Courtesy of Tomihisa Ohta

A beaker of water with a mixture of iodine and cesium during a water decontamination experiment conducted by Tomihisa Ohta and Kumaken Kougyou Co.



Courtesy of Tomihisa Ohta

Ten minutes after the powder was stirred into the water mixture and captured the cesium and iodine substances.

The company confirmed its links with Mr. Ohta, leaving the chemist to take the lead in discussing the new project.

Mr. Ohta said he reached out to Fukushima Daiichi operator Tepco and the government about a week ago when he finished developing the radioactive bent powder. Discussions are ongoing, he said. Relevant Tepco and government officials couldn't immediately be reached for comment.

Mr. Ohta attributes the gap to different chemical structures, but said he cannot speculate further since he doesn't know specifics about Areva's process. Mr. Ohta's technology has been tested in experiments, but as yet has not been used in industrial applications.

In Mr. Ohta's version, once the radioactive material is captured it then precipitates, drawing the irradiated parts out from the water, which then fall into a murky pile at the bottom of a container leaving the rest of the liquid clear much like an undisturbed snow globe. In experiments, scientists added 15 milligrams of powder to 100 milliliters of water steeped in non-radioactive cesium that had been dissolved at a density of 1-10 parts per million. (The densities of radioactive substances at Fukushima Daiichi are estimated at about 10 ppm; Mr. Ohta said the powder can handle densities as high as 100 ppm.) The purification process was completed 10 minutes later, according to Mr. Ohta, adding that the process would not take much longer than 10 minutes even if treating thousands of tons of water at a time.

"Almost 100% of radioactivity will be removed (from the water)," said Mr. Ohta.

Mr. Ohta said the substance could be used to help cleanup efforts at Fukushima Daiichi immediately as soon as several water treatment facilities are built like the unit being erected by Areva. Researchers did not use radioactive substances in the experiment, but Mr. Ohta said he's confident the powder would produce the same results regardless because the chemical properties are the same.

The powder's DNA was completed very quickly – in under a month. The base is modeled after a similar powder that decontaminates water laced with industrial and metallic pollutants, usually found near factories. Mr. Ohta tweaked the original prescription, which he began to devise six years ago, targeted towards heavy metals like magnesium, iron and cobalt, so the chemical components complemented radioactive isotopes iodine, cesium, strontium and plutonium. The chemist declined to disclose the exact composition due to patent reasons, but said the material is easy to obtain and rich in supply.

"I never imagined that our product could be used in this kind of way. I had never thought about nuclear pollution," said the scientist, who has remained almost exclusively focused on natural substances and environmental pollution.