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SCIENCE (/SCIENCE)

CSIR-NIIST tech to make limenite richer in titanium dioxide

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CSIR-NIIST

Thiruvananthapuram: A technology developed by CSIR-National Institute for Interdisciplinary Science and Technology (NIIST) to make ilmenite richer in titanium dioxide is being evaluated by CSIR-National Environmental Engineering Research Institute (NEERI) on the request of Kerala Minerals and Metals Limited (KMML). The technology, according to scientists at NIIST, produces less amount of acidic effluent, and can bring down not just pollution, but even the cost of production.

The technology can benefit titanium companies like KMML and CERL in Kerala, and DCW in Tamil Nadu, but not Travancore Titanium Products Limited which has been ordered by the Central Pollution Control Board to shut down. The NIIST process suits plants which rely on chloride process, while the TTP relies on sulphate process. Sources in KMML say that they are consulting NEERI to evaluate many such technologies, which claim to enhance ilmenite using environment-friendly and cost-effective processes. Acid is used in titanium plants to remove the iron content in ilmenite and turn it into rutile which is richer in titanium dioxide.

To cure each tonne of ilmenite, 2.5 tonnes of hydrochloric acid is required. Since annually plants produce 20,000 to 30,000 tonnes of titanium dioxide, huge quantities of acid have to be used, according to scientists. In the NIIST process, instead of using acid, ilmenite is passed through a coal-based rotary kiln. Inside the kiln, there will be a mixture of carbon monoxide and carbon dioxide. Carbon

monoxide reduces iron oxide in ilmenite to metallic iron. The metallic iron is separated from ilmenite in a rusting reactor which contains water and catalyst. Most of the iron would be converted to iron hydroxide. Only 8-9 percent residual iron would remain, which is then removed using acid. “This ensures that the acidic effluent is much less. Moreover, only 0.5 tonne of acid is used per tonne of ilmenite, which brings down the cost,” a scientist at NIIST says.

Tags: csir-niist (/content/tags/csir-niist), titanium dioxide (/content/tags/titanium-dioxide)

Location: India (/location/india), Kerala (/location/india/kerala)

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