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NIIST's novel technology to check acidic pollutants in TiO₂ production by PSUs

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THIRUVANANTHAPURAM: Cancer causing Acidic effluent flow from public sector undertakings (PSUs) in Kerala involved in the production of titanium dioxide (TiO₂) pigment could be minimised if it opts for a novel technology. This innovative technology developed by CSIR- National Institute for Interdisciplinary Science and Technology (NIIST) would help reduce 75 percent acidic pollutant discharge in the production of TiO₂ from ilmenite ore extracted from the black sands of Kerala.

Now, this new technology developed at NIIST proved successful in the production of titanium feedstock with more than 90% TiO₂ in laboratory and semi pilot plant scale. The process is most environment friendly with more than 70% reduction in acid consumption and bulk of the iron is removed in the form of oxides, free of excess acidity and chloride contamination, CSIR- NIIST director A Ajayaghosh told TOI.

"This new technology assures to reduce 75 percent acidic effluent discharge by removing iron from ilmenite" NIIST senior scientist Harikrishna Bhat told TOI. Further he said, Ilmenite mineral from coastal sands of Kerala contains 58 percent titanium dioxide (TiO₂), iron and iron oxide. The technology involves removing iron from ilmenite through metallisation and rusting process to separate 80 to 85 percent TiO₂. This rutile grade TiO₂ is further enriched to produce 90 per cent TiO₂, which is high

rutile grade titanium dioxide, a white pigment used as paints for aerospace components. The titanium alloy developed from high grade TiO2 is resistant to high temperatures and corrosion and is used for aircraft, armour plating, naval ships, spacecraft's, he said.

As part of technology transfer, NIIST has partnered with a Tamilnadu based company VV Minerals which is keen to demonstrate the technology at its 100 Tonnes per day capacity plant facility. The company in the presence of its director V Subramanian has already signed an agreement with NIIST to implement the technology.

The PSUs involved in TiO2 production include Kerala Minerals and Metals Limited (KMML) at Chavara and Travancore Titanium Products (TTP) at Veli. TTP's mode of production of TiO2 pigment is through the sulphate process using sulphuric acid to produce anatase grade TiO2. It is considered lesser grade TiO2 used for interior paints and electronic components, compared to KMML's rutile grade TiO2 produced from chloride route using hydrochloric acid. Both these PSUs indicate that they have sewerage treatment facilities, yet the acidic discharge could be minimised further, if it opts for change.

While, Kerala PSUs are yet to opt for the technology. "I had appraised about this technology process to KMML and it could be inducted with minimum investment. I will also write to the concerned Ministry to take it forward for such state PSUs," Ajayaghosh said.