PHYSICO-CHEMICAL PROCESSES FOR WASTEWATER TREATMENT

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While municipal wastewater treatment plants primarily rely on mechanical and biological processes, advanced physico-chemical methods play a crucial role in treating complex industrial wastewaters, handling poorly biodegradable compounds, managing inorganic pollutants, and meeting stringent effluent quality requirements.

This presentation provides a comprehensive overview of advanced separation and conversion technologies primarily utilized for treating complex industrial effluents and meeting stringent effluent quality standards. It systematically explores the purpose, mechanisms, operational parameters, and practical applications of various unit operations, including preliminary oil-water separation, granular and cake filtration, flotation techniques (such as DAF), neutralization, and chemical precipitation. Furthermore, the curriculum covers advanced methods like coagulation-flocculation, ion exchange, adsorption, stripping, pressure and electrical membrane processes, advanced oxidation and reduction processes (including wet and supercritical water oxidation), and high-temperature thermal incineration.