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Protein and Mineral Removal from Dairy Waste-Water Using Precipitation Process

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Abstract : Whey is a by-product of the dairy industry whose major components are lactose (44–52 g/L), proteins (6–8 g/L) and mineral salts (4–9 g/L). Approximately 50% of 121 million tons of whey produced in the world in 1993 were disposed into rivers, lakes or other water bodies, treated in wastewater treatment plants or loaded onto land. This represents a significant loss of resources and causes serious pollution problems since whey is a heavy organic pollutant with high COD and BOD values, 40–60 g/L and 50–80 g/L, respectively. The removal of cheese whey proteins and minerals represent an important task both in environmental and in food sciences. The most important treatments which are considered in this study, have been done by using lime, Al2O3, FeCl3 and AlCl3 along with heating and also acidic-alkaline method. Results show that the best way for removal of protein is accomplished with adding HCl to decrease pH from 6 to 4, boiling for 20 min, and filtering protein aggregates. Also partial demineralization in whey solution for reducing ash is accomplished by adding NaOH to increase pH to 7.2 and heating solution for 20 min.

Keywords : whey treatment, dairy industry, precipitation, protein, mineral
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