



Effect of rice husk flour size on sewage sludge dewaterability during composite conditioning with persulfate

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ABSTRACT

Rice husk flour (RH) was used as a skeleton builder and the effect of its size on sewage sludge dewaterability during composite conditioning with activated persulfate was studied. The results showed that the composite conditioner is effective for the capillary suction time and the specific resistance to filtration was decreased by 95.5% and 92.8%, respectively. Moreover, the water content of sludge cakes were decreased by 26% and the net sludge solid yield was increased by 93%. The RH sizes of <0.075, 0.075–0.15, 0.15–0.25 and <0.25 mm used for sludge conditioning were investigated. Results showed that the best sludge dewaterability was achieved when the RH used as skeleton builder was 0.075–0.15 mm in size. The net sludge yield and compressible coefficient of sludge cake were varied when different skeleton builder sizes were used, indicating that size influenced the sludge dewatering performance. The compressible coefficient decreased after the composite was conditioned, showing that the sludge can form a rigid and permeable lattice structure under high pressure. These features enable the formation of channels where water can flow out, which improved sludge dewaterability. All these findings showed that the net sludge yield and compressible coefficient of sludge cake was the highest and lowest, respectively, when the RH size was 0.075–0.15 mm, corresponding to the best dewatering performance.

Keywords: Rice husk flour; Skeleton builder; Sludge dewaterability; Particle size; Compressible coefficient

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