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PRAPAPORN LEUKITTISUP: DEFLUORIDATION IN DRINKING WATER BY BONE CHAR AND FLY ASH. THESIS ADVISOR: KOMOL SIVABORVORN, Dr.P.H. (Env.Health Science), PRATHIP PHANTUMVANIT, M.S. (Biochemistry), KRISANA TEANKAPRASITH, M.S.(Env.Health), CHAOVAYUT PHORNPIMOLTHAPE, M.S. (Ind. Eng. Operations Research). 111 p. ISBN 974-661-017-1

The purpose of this study is to defluoridate drinking water by using bone char and fly ash as adsorbent. This batch study was conducted using 50 ml synthetic water samples with varied levels of initial fluoride concentration of 1, 2, 4 and 8 mg/l and adsorbent weight at 1, 2 and 4 g with pH levels of 6.5, 7.5 and 8.5 for bone char and 2, 3 and 4 for fly ash, respectively.

The results show that the efficiency of defluoridation of bone char and fly ash decreased when the pH increased. The efficiency of bone char and fly ash were 99.63% and 99.89% at pH 6.5 and 2, respectively. It is found that at low initial fluoride concentration, great adsorbent weight and high pH, the defluoridation capacity was low, and vice versa. The maximum defluoridation capacities of bone char and fly ash were 287.17 and 404.20 mg F/kg adsorbent at initial fluoride concentration 8 mg/l, adsorbent weight 1 g and pH 6.5 and 2, respectively. When compared the efficiency of bone char and fly ash at pH 6.5, it is found that at pH 6.5 the efficiency of bone char was better than that of fly ash in all experiments. Moreover, when fly ash was used, Chromium (Cr) was detected in treated water samples at high levels exceeding the drinking water standard. Besides, the defluoridation efficiency of fly ash increased at low pH levels. Therefore, fly ash is not a suitable adsorbent for drinking water.