E2-46: Water purification using capillary columns: silicone vs teflon

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A new method for the removal of organics from contaminated aqueous solutions was described previously, whereby the organics were removed by adsorption/absorption on the walls of 'plastic' capillaries made of silicone, teflon, etc, during passage of these solutions through the columns. A correlation between the extent of removal of solutes with parameters such as column length, internal and external diameters, and solution flow rates, had been established for silicone capillaries. The present study has attempted to see whether this relationship holds for teflon capillaries as well, by comparison of actual versus theoretical % removal of organics using columns of different lengths, internal diameters and different flow rates of solutions through them. It was found that the relationship for silicone capillaries was not valid for teflon capillaries. Although lower amounts of organics were removed from the solution at higher flow rates, in agreement with theoretical predictions, the actual removal was far greater than the predicted values. Further, much lower amounts were removed as compared to theoretical predictions with increasing column legth. Although no significant differences were observed in the amounts of organics removed with columns of different diameters, theory predicts the amounts removed to decrease with increasing diameter. The non-applicability of this theoretical treatment to teflon columns was probably due to differences in absorption and diffusion characteristics between silicone and teflon.