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MULTIWALLED CARBON NANOTUBES MEMBRANES FOR DRINKING WATER

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Abstract : Nanomembranes were fabricated with MWCNTs and cotton for mesh and fiber support to remove pollutants and meet the World Health Organization (WHO) parameters for drinking water. After the nanofiltration process the following results were obtained: Escherichia Coli was reduced from 6.8 per 100 ml to 2.0 per 100 ml, Turbidity obtained was reduced from 4.04 to 0.23 mg/l; Magnesium content was reduced from 93.14 mg/l to 13.62 mg/l, total hardness was reduced from 450 mg/l to 132 mg/l, the color diminished from 58 units to 1.0 units, pH got reduced from 6.87 to 6.44.

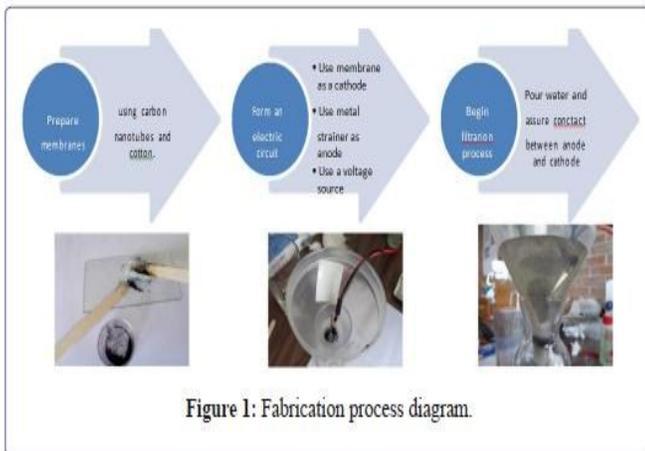|	Pathogenic *Escherichia coli* / total/100 ml
Before nano filtration	6.8
After Mwcnt nano membranes filtration	2.0

Table 2 ; E Coli before and after nanomembranes filtration per 100 ml

Figue 2 ; Certified water laboratory analysis

Results ; The results show that the quality of water can be improved using multi wall carbon nanotubes to meet drinking water requirements. In addition, electric current was used through membranes to create electro separation of pollutants and let filtrated water to pass. The results also showed water with less pollutants, better color, and less turbidity after the Nano filtration process. This is an approach in the use of Nanotechnology for waste water treatment and increase the access to drinking water to more people around the World.

Figure 1: Fabrication process diagram.

Water pollutants	Before filtration	After filtration
Total coliforms	6.8 per 100 ml	2.0 per 100 ml
pH	6.87 mg/l	6.44 mg/l
Turbidity	4.04mg/l	0.23mg/l
Total hardness	450 mg/l	132 mg/l
Color	58units	1.0unit
Magnesium	93.14 mg/l	13.62 mg/l
chlorides	18.5mg/l	17.50mg/l
Calcium	30.46 mg/l	27.25 mg/l
Sulfates	7.0mg/l	6.0mg/l
Manganese	0.132 mg/l	0.08 mg/l
Alkalinity and bicarbonates	126 mg/l	120 mg/l

Table 1; Physiochemical analysis