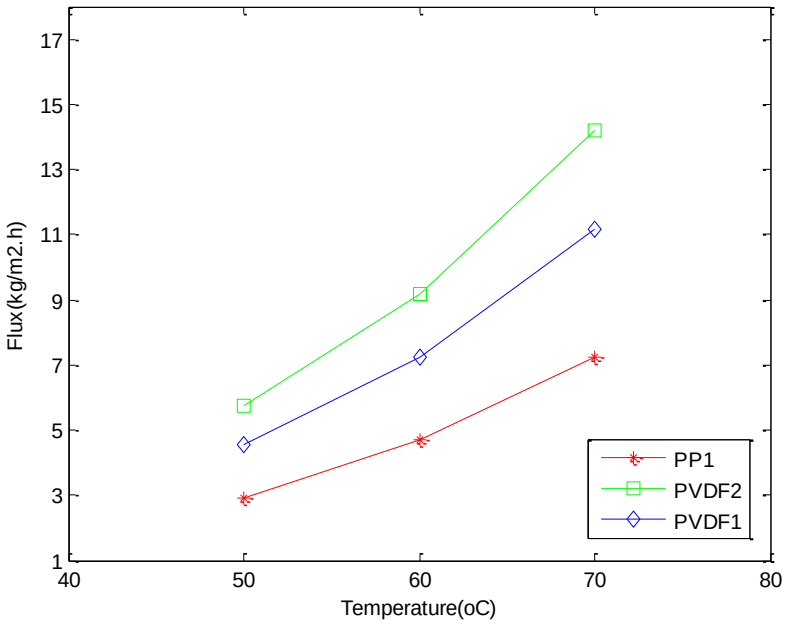

Figure 2. Effect of feed temperature on flux for different membranes

The properties of the obtained permeate show that rejection factors higher than 99% with respect to total dissolved solids and higher than 90% with respect to total carbon have been achieved in all the lab made membrane modules.

For what concerns the estimation of the costs in desalting produced water through DCMD, the economical evaluation has been made including annual operating costs, direct and indirect capital costs (details can be found in [2]). Data from cost analysis indicate that, considering 5 years as membrane life-time and 70% as MD recovery, water cost is equal to 1.28\$/m^3 when the temperature of the produced water fed to the system is 20°C whereas water cost is equal to 0.72\$/m^3 when the temperature of the produced water fed to the plant is 50°C (ΔT=25°C and temperature of the DCMD feed inlet =50°C) .

4. Conclusions

A study was performed to test the potentiality of using DCMD for desalting high saline oilfield produced water. Both PVDF and PP membranes were utilized. DCMD showed an excellent rejection both of the total solids and of the carbon present in the saline feed solution. Membrane modules with PVDF membranes characterized by the higher pore size and the lower membrane thickness showed the higher trans-membrane flux. Moreover, data from cost analysis indicate that for MD operating at 50℃ and with a recovery of 70%, desalted water cost is 0.72\$/m^3 when the temperature of the produced water fed to the plant is 50℃ and 1.28\$/m^3 when the temperature of the produced water fed to the plant is 20℃.

Acknowledgments

This work is part of collaborative study between the Water Research Center (WRC) of the Kuwait Institute for Scientific Research (KISR) and the National Research Council – Institute on Membrane Technology (ITM-CNR). The contributions of WRC staff in the oil field and at KISR labs as well as ITM-CNR lab staff are hereby acknowledged.

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