Project Title:

Future prospect of Forward Osmosis technologies for waste water treatment of power plant

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Project Summary:

At a thermal power plant or Combined cycle power plant, different kind of pollutants through the power plants effluent may be discharged into the environment which led to contamination of aquifers. Due to water scarcity of Iran, recycling and reuse of wastewater is seriously considered from power plants by implemention of recovery processes and construction of new wastewater treatment plant. In this issue, applying suitable wastewater treatment technologies and reduction of the concentration of pollutants to a standard level is considered in order to reduce environmental contaminations. Studies have been done in the field of industrial wastewater treatment is shows that membrane filtration processes have a good efficiency in terms of performance and costs relative to the conventional processes of water and wastewater treatments. Among the membrane processes, Forward osmosis has been suggested for a wide range of engineering applications including water and industrial wastewater treatments.

In addition to the application of forward osmosis to recover the waste water from the power plant, it can be used to prevent the discharge of various wastewater into the environment, production of water with the desired quality in order to provide part of the water used by the power plant, reduced the volume of sewage and economical savings resulted from this decline and also saving on the water resources. On the other hand optimal performance of forward osmosis process is depend on the selection of the suitable membranes and draw solutions as well as an appropriate solution recovery system with regard to the purified wastewater and the purification system's goals. As a result, by examining and selecting the above mentioned components, its expected to reach higher water flux as well as more effective selectivity of the process.

Project Results:

- Future study of water production from waste water
- Description of the process of forward osmosis
- Determination of the proper wastewater effluents to be recovered by forward osmosis process
- Provide a Road Map for the Development of forward osmosis Processes in Iran
- Provide the scheduling and budgeting plan in the 20-year horizon

Project Documentation:

- Investigation of the amount of wastewater effluets produced in thermal power plants of iran.
- Investigation of the quality of wastewater effluets produced in thermal power plants of iran.
- Investigation of current employed wastewater treatment technologies in power plant
- Description of the process of forward osmosis
- Investigate on the restriction of the FO process control and management and compare them with other commonly used water treatment processes such as RO
- Survey on hybrid FO technologies and Identify the advantages and disadvantages of using these technologies and compare their performance with the commercialized RO process and selection of superior technologies
- Investigation of the Large FO companies
- Determine the effective factors which influence the construction and operation of the FO technologies and anticipate the challenges facing the development of each factors
- Outlook for hybrid forward osmosis technologies
- Economic and cost estimation of FO Processes and its comparison with current commersial wastewater treatment Processes in Power Plant
- Investigate the status of FO technology in the foreign water & wastewater treatment technologies roadmap

- Specification and classification of wasterwater effluents of iranians power plants Based on quality, salts type and amount of salinity; selection of draw solutions and appropriate membranes in order to applied them for recovery of water from power plant wastewaters
- Represent the technology development outlook for iranian research centers and industries, set for the 20 years horizon