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| UOIT |
| Assignment # 2 |
| ENGR 4510 – Nuclear Plant Chemistry |
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| **Dylan Sivekumar – 100 421 070** |
| **10/21/2013** |

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[University of Ontario Institute of Technology](http://www.uoit.ca/EN/index.html)

**ENGR 4510: Nuclear Plant Chemistry**

**Fall Semester 2013**

**Assignment # 2**

**Due: October 21, 2013 @ 6:30 PM**

1. As we discussed in class, ion exchange resin is used in a number of station systems for purification.

Please present you understanding of ion exchange resin. You may use any references as long as you provide the source.

Ion exchange columns are used for the system purifications. Some examples include; demineralized water in the water treatment plant, steam generators, and also the purification in the heat transport system. The ion exchange resin is made up of beads in the exchange columns; there is positive cation beads and negative anion beads. When the substance goes through the column, the charged beads get transferred. Without the ion exchange resin, the impurities would not be able to be removed.

In the water treatment plant, the demineralized water process removes any inorganic material. There is a strong acid and base as well as a weak acid and base. The strong acid is hydrogen and this is the cation, and this will help dissolve any salts. The strong base is a hydroxide, and this would remove the salts that were dissolved into the acids. The example from the lecture (Lesson 2) is shown below;

**Na+ Cl -  + H+ OD-  → Na+ Cl- + H+ OD-**

In the above reaction, the resin bed is with the positive cation, (H+) and the sodium chloride is by itself, after the beads interact, the get transferred to the sodium chloride and now it is possible to remove the impurities by removing the beads.

Reference

Dymarksi, M. (2013). Lesson 2 Cooling Water and Water Treatment Plan [PowerPoint slides]. Retrieved from http://uoit.blackboard.com