[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 resins are a useful tool in filtering and purifying water. It has a variety of applications and can be used in a number of different systems. This includes demineralized water treatment plants, steam generators and PHTS purification.

An ion exchange resin is made up of a number of tiny beads where there are both positive cation beads and negative anion beads. When a substances passes through the columns, the beads provide a high surface porous area to facilitate ion exchange. They also contain fixed ions in their structure. The positive cation beads contain strongly acidic cations and the negative anions contain strongly basic anions which need to be neutralized with a respective counterion. The water that comes has dissolved salts which contain both positive and negative ions and as they pass through these beads, attach themselves onto these structures. In effect, the water no longer contains the dissolved ions and has been purified.

The beads are considered spent once the charge is neutralized and can be removed and replaced with new beads.

# References

*Ion Exchange for Dummies.* (2013). Retrieved October 21, 2013, from Rohm and Haas: http://www.lenntech.com/Data-sheets/Ion-Exchange-for-Dummies-RH.pdf