

Iron-Magnesium Alloy Bioabsorbable Blood Stent

Kaitlyn Jarry, Purdue University and L Stanciu, Purdue University

Bioabsorbable materials are fairly new and proper alloys for implantation in the body have not yet been established. There are a few polymers that have showed promise, but they do not provide the proper mechanical support that metal does. These materials would be used to create devices such as blood stents and orthopedic screws. Investigation into the properties of different alloys can help to establish a material that can be used for implanted devices that are only needed for a limited amount of time. In order to investigate these alloys many different experiments will to be run to test the different properties. This includes corrosion tests, and cytotoxicity tests. Corrosion will be tested by using potentiodynamic polarization tests to accelerate the rate of corrosion. Cytotoxicity tests will be performed by incubating the cells with the material for a certain period of time to establish that the material does not cause cell death. The corrosion test showed that the alloy that was cold worked had a reduced corrosion rate as compared to the samples that were quenched. The cytotoxicity tests are currently underway and it is hoped that they will show no decrease in cell death when compared to a control. Cold working and changing the microstructure appears to reduce the corrosion rate. More investigation into what properties influence the corrosion rate of materials is needed. The cytotoxicity will hopefully increase cell growth meaning that when implanted it will encourage recovery and reconstruction of the damaged area.