

Graz, am 13.11.2018

## Master's thesis and project “Biobased quinones for aqueous energy storage devices”

Quinones are naturally occurring substances which can be oxidized and reduced reversibly. In recent years they are in focus for the storage of electrical energy in solutions. Therefore one can build Redox-Flow batteries, such solutions are pumped through a rather small cell where the redox-reactions takes place to increase the storage capacity.

While commercially available Redox-Flow batteries are mostly based on heavy metals (Vanadium), the first examples of quinones are now also considered to be economically feasible. Unfortunately, those are usually synthesized from petrol-based chemicals. However, some of these can be produced in large scale from wood, which could be a cheap and environmentally friendly feedstock for their synthesis. Unfortunately, some of the quinones compounds are rather labile. In particular photo-chemical processes can lead to unwanted side-reactions which should be avoided by optimization of the conditions and employment of different stabilizers.

For the analysis spectroscopic methods as NMR, cw-EPR, UV-Vis as well as electrochemical methods can be employed. As final goal the performance of the quinones should be evaluated in a laboratory scale redox-flow battery.

Financial support is available. If you are interested to join a young and dynamic team, feel free to pass by or to contact us via e-mail!

Werner Schlemmer:

[werner.schlemmer@tugraz.at](mailto:werner.schlemmer@tugraz.at)

Stefan Spirk:

[stefan.spirk@tugraz.at](mailto:stefan.spirk@tugraz.at)

