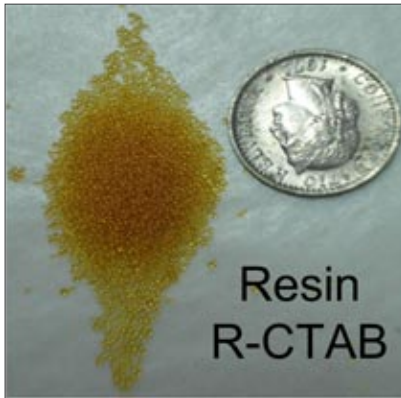




Stefan Fritschi

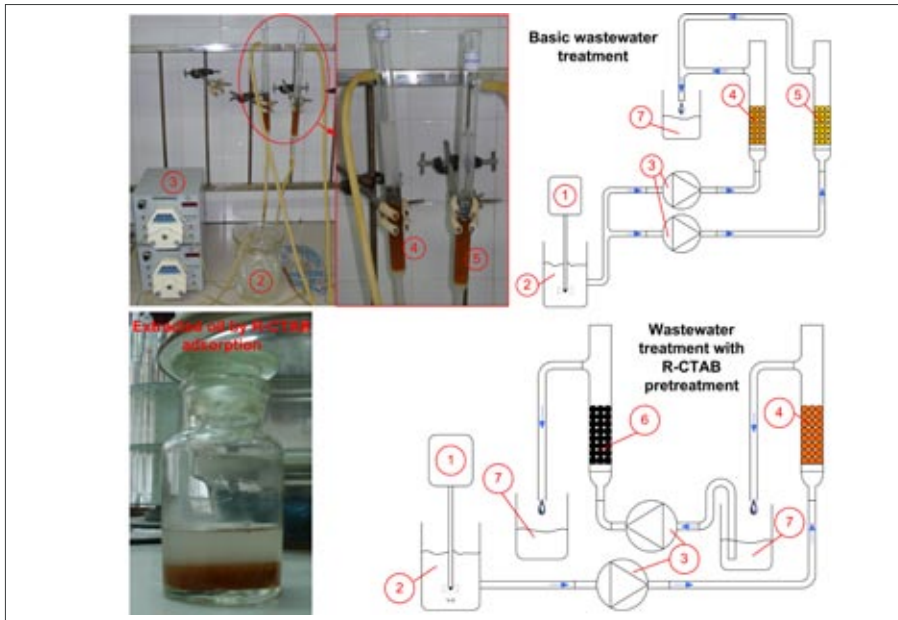
# Study on Characteristics of Modified Resin and Oily Wastewater Treatment Behavior by Changing Parameters

Graduate candidate	Stefan Fritschi
Examiner	Prof. Dr. Rainer Bunge
Co-Examiner	Christoph Hug, Hug Engineering AG, Rätterschen
Subject area	Energy and Environmental Technology
Project Partner	East China University of Science and Technology (ECUST), Shanghai



**Problem:** Emulsion wastewater is one of the most important industrial wastewaters resulting from various manufacturing industries, including metal manufacturing and its processing. It is necessary to purify this water so that it can be recycled to save water resources and to protect the environment.

**Objective:** The main task of this study was to characterize a modified resin (R-CTAB) and to develop the complete wastewater treatment process. This was accomplished by changing parameters like material, volumetric flow, wastewater concentration and the height of the resin column ( $\Delta H$ ).



1. Stirrer, 2. Wastewater, 3. Pumps, 4. R-CTAB, 5. R-H, 6. A-Carbon, 7. Purified Wastewater

**Solution:** The waste water treatment project of ECUST University is based on R-CTAB. The wastewater treatment with R-CTAB can be described as follows: The oily wastewater permeates the R-CTAB. During this time the interchange between R-CTAB and wastewater leads to an agglomeration of oil droplets. These larger oil droplets cream to the surface of the wastewater and are removed. In addition, a small amount of oil is adsorbed by the R-CTAB surface. The R-CTAB has an oil removal efficiency of about 80 %. Overall R-CTAB can be considered as a good de-emulsification material.

To improve the wastewater treatment process with R-CTAB, a further purification of the effluent was carried out with activated carbon. These two steps combined improved the oil removal efficiency up to 95 %, which is extremely high.