May 26-28, Leeuwarden

IAP 2014 Interfaces in Water and Environmental Science

provinsje fryslân
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wetsus
centre of **excellence** for
sustainable **water technology**

WATER CAMPUS
Leeuwarden

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- Northern Netherlands Provinces (REP-SNN)
- the City of Leeuwarden, the Province of Fryslân and University Campus Fryslân

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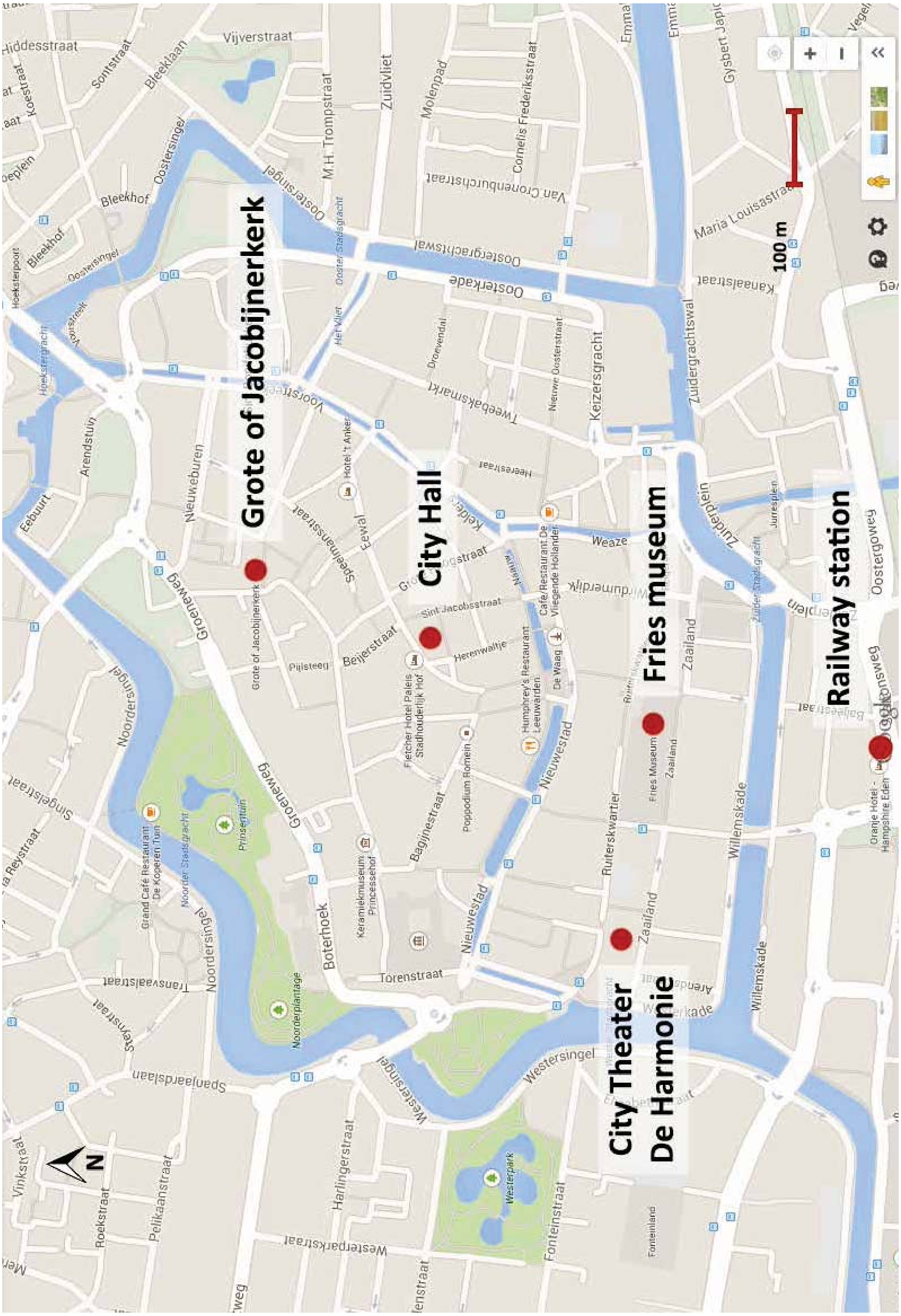

Leeuwarden, City Center

Welcome

The 8th International Conference Interfaces Against Pollution (IAP2014), held in Leeuwarden, the Netherlands from May 25 to 28, is part of a proud series of conferences initiated in Wageningen (The Netherlands, 1997) and followed in Miskolc (Hungary, 2002), Julich (Germany, 2004), Granada (Spain, 2006), Kyoto (Japan, 2008) , Beijing (China, 2010) and most recently in Nancy.

IAP conferences seek to provide a forum for researchers working in the interdisciplinary field of Environmental Science. Colloids and Interfaces in natural and engineered media are at the heart of the conference. This includes topics of societal concerns like environmental protection, remediation of polluted sites, water treatment, optimization of mineral resources and the impact of nanotechnology residues on the environment.

IAP has a broad, but fundamentally scientific scope, which has broadened over the years. The IAP 2014 specifically has shown to attract a large community in the field of capacitive desalination. In line with the wide spectrum of disciplines (physics, biology, physical chemistry, mineralogy) relevant for environmental science, IAP2014 is intended to cover research from work at the nano-, meso- and macroscopic scales, from transient processes to equilibrium.

The international IAP advisory council and the local IAP2014 organization committee would like to thank our sponsors Gemeente Leeuwarden, Provinsje Fryslân, Wetsus, Water Campus Leeuwarden, Voltea, IACIS and ISE for enabling this conference.

The international IAP advisory board and the local IAP2014 organization committees wish that this conference will be an opportunity for all participants to share fruitful discussions, in Leeuwarden.

Conference chairs

Prof. Dr. David Waite (University of New South Wales, Australia),
Dr. Bert Hamelers (Wetsus, The Netherlands)

Mayor Ferd. J.M. Crone of the City of Leeuwarden, capital of the province of Fryslân:

Welcome to Leeuwarden, the European Capital of Culture 2018!
Leeuwarden is a dynamic city which is situated in a green and water-rich environment.
The city has a watery heart and a heart for water.
The abundance of water is a defining feature of the city's image and atmosphere. The recovery of water, energy, food and resources has a high priority. In addition, water is an important factor in the research and development of water technology and sustainability. The expansion of the Water Campus Leeuwarden is a good example of this.
I wish you an interesting congress and enjoy your visit to Leeuwarden, the Capital of Water Technology.

Analysis of surface of the titanium electrode after precipitation of indium

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Abstract: Electrochemical characteristics of deposition and dissolution of indium in chloride solutions using the method of cyclic voltammetry were determined. The effect of the polarization of the interval and scan rate at electrochemical reactions which occur in the system was studied. Electron microscopy observations and X-ray diffraction patterns confirmed the formation of crystalline indium deposits.

Keywords: indium, discharge-ionization, current density, scan rate, electrode process, potential

Currently, there is increasing interest to the problem of obtaining high-purity indium /1/. This work is a continuation of studies of electrochemical behavior of In^{3+} on platinum and titanium electrodes to find effective ways of cleaning rough indium /2/. Methods of scanning electron microscopy and X-ray diffraction analysis used in this work have revealed the presence of cathodic precipitated metallic indium on the surface of the titanium electrode and helped to find optimal conditions of the processes studied. Chronoamperograms of studies carried out were obtained to study the effect of electrolyte concentration, potential and electrolysis time on the precipitation and dissolution of indium. Variation of potentials interval revealed the potential of total precipitation of indium on the surface of titanium electrode, which amounted to -1.1 V. This result was obtained on the basis of X-ray diffraction analysis and scanning electron microscopy of surface of samples of titanium electrode coated with metallic indium. Changing the concentration of indium in the solution has a strong influence on the rate of recovery of indium. Analysis of the electrode surface after polarization at different concentrations of indium in the solution (0.1 M) revealed an optimal concentration of 0.5 M, when there is a maximum recovery rate of indium. Furthermore, the results of scanning electron microscopy showed that the best precipitation for all three concentrations occurs at the potential of -1.1 V. During the electrolysis of 0.5 M sodium chloride solution, indium (E_e = -1.1 V), the formation of coarse sediments of indium on titanium surface is observed. Carrying out the electrolysis at potentials of -0.8 V and -1.3 V results in the formation of non-uniform precipitation of amorphous indium. Apparently at -0.8 V only beginning of precipitation of indium is observed, and at -1.3 V the recovery of hydrogen occurs, complicating the process of precipitation of indium. Indium precipitations obtained in these experiments were analyzed by XRD method.

Experiments on the effect of electrolysis time were carried out for a detailed investigation of indium precipitation process on the surface of titanium. The amount of precipitated indium and crystals become larger with the increase of electrolysis time.

Chronoamperograms of indium precipitation and dissolution at potentials of E = -1.1 V for the cathodic process and E = -0.5 V and E = 0.2 V for the anode were obtained to identify the potential of indium ionization on titanium electrode surface. It is obvious from the results of X-ray diffraction analysis and scanning electron microscopy that the shift of dissolution potential in the anodic region leads to an increase in the rate of oxidation of indium.

Thus the results of presented work can be used in the development of electrochemical method of indium refining.

References

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Poster Presentations Monday