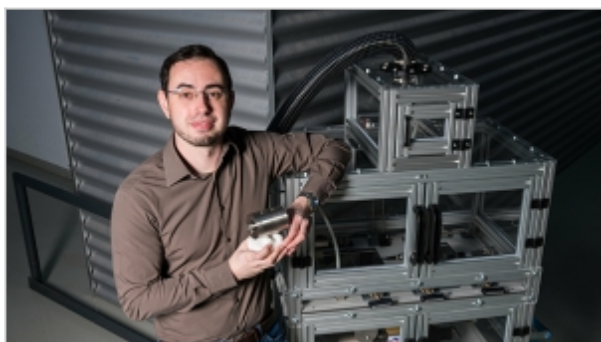


New sensor system to test fuel quality at hydrogen filling stations

Research aims at developing a sensor system that can provide continuous in situ monitoring of hydrogen quality at hydrogen fuelling stations.



Professor Andreas Schütze and his research team at Saarland University are collaborating with research partners to develop technology that ensures that the fuel cell is only fed with high purity hydrogen, thereby extending the service life of the fuel cell. Project partners include the Fraunhofer Institute for Solar Energy Systems ISE and Hydac Electronic GmbH.

The infrared measuring cell will be installed inside the hydrogen filling station and will have to operate under very challenging conditions. The sensor system has to work reliably, despite the extremely high pressures and short refuelling times. 'Contaminants can actually poison the fuel cell,' explains sensor expert Professor Andreas Schütze from Saarland University. 'The challenge is twofold: measuring at the required level of precision and coping with the conditions under which the sensor system needs to operate,' says Schütze.

The research team is therefore developing an infrared measuring cell that can measure reliably and accurately under these extreme conditions. The very high pressures to which their sensors are exposed are in fact utilized by the team to further improve the sensitivity of their process.

'One of the questions we're studying at the moment is whether and how the intensity of the infrared spectrum we measure changes with pressure. The sensor system has to be able to reliably detect a range of contaminants at concentration levels significantly below what we find in oils,' explains Marco Schott, a doctoral student working on the hydrogen measuring cell.

The new sensor system will be undergoing operational trials this autumn. The research team from Saarbrücken will be at this year's Hannover Messe starting 1 April, where they will be showcasing their high-pressure test rig at the Saarland Research and Innovation Stand.