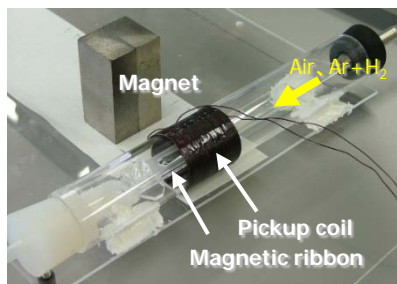
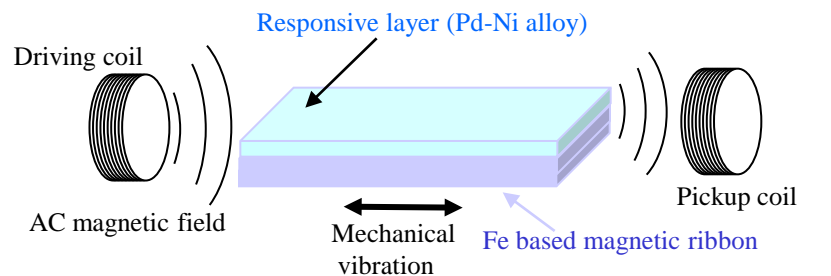
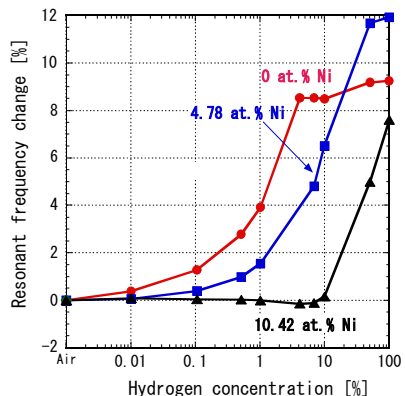


Wireless gas sensors composed of magnetic ribbons

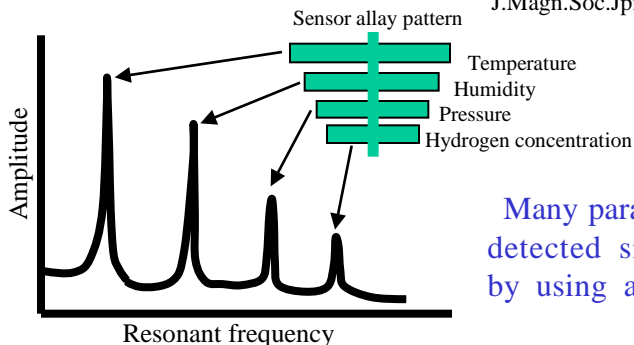
Professor Osamu Ishii



Wireless hydrogen sensor



Hydrogen concentration vs resonant frequency change. T. Shibata et al.; J.Magn.Soc.Jpn.33. 50-53 (2009)



Many parameters can be detected simultaneously by using a sensor array.

Content:

We develop a wireless, passive, remote query hydrogen sensor comprising a magnetic ribbon coated with a volume-changing hydrogen responsive Pd-Ni alloy film. In response to a magnetic field impulse, the ribbon vibrates at a characteristic resonant frequency that is linearly dependent upon the volume of the attached hydrogen responsive film. The mechanical vibrations of the sensor launch magnetic flux, which can be detected remotely using a pickup coil. By monitoring the resonant frequency of the sensor, the atmospheric hydrogen concentration can be determined without the need for physical connections to the sensor or specific alignment requirements. Greatest sensitivity is achieved with a film comprising a 95.3%Pd-4.7%Ni alloy.

A wireless humidity sensor is also investigated by employing conductive polymers as the responsive layer materials. Since the polymers absorb water vapour and expand, the resonant frequency changes with the atmospheric humidity.

Yamagata University Graduate School of Science and Engineering
Research Interest : Magnetic devices

E-mail : oishii@yz.yamagata-u.ac.jp
Tel : +81-238-26-3395
Fax : +81-238-26-3299

HP : <http://ishii-kambelab.yz.yamagata-u.ac.jp/>

