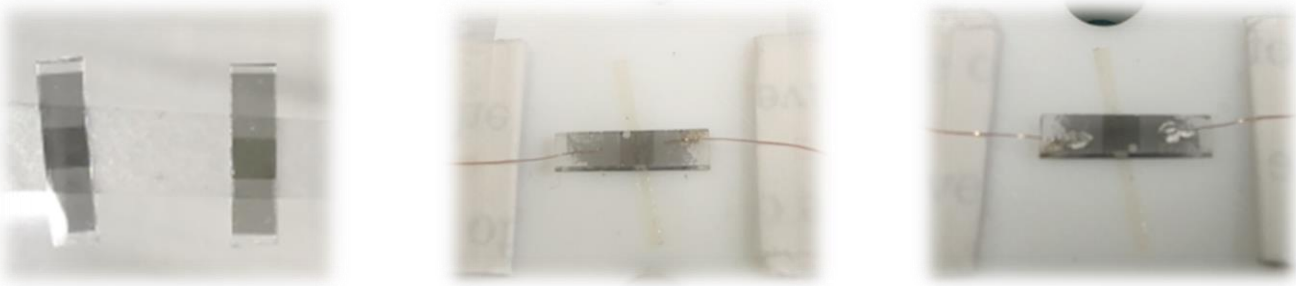
Ferromagnetic thin film and spin current (3)

Product used : Electron spin resonance spectrometer (ESR)

***** Sample preparation *****

The method that detects the spin dependent recombination current in the semiconductor or the electromotive force derived from inverse spin-Hall effect using an ESR instrument is usually called electrically detected magnetic resonance (EDMR).
While a conventional scheme detects microwave reflection, EDMR measurement detects potential difference of devices attached to electrodes. Therefore, it is necessary to prepare electrodes, lead wiring and a sample tube. Here, a simple example of sampling for EDMR is introduced.

An example for fabrication of electrodes and electric wiring to thin film



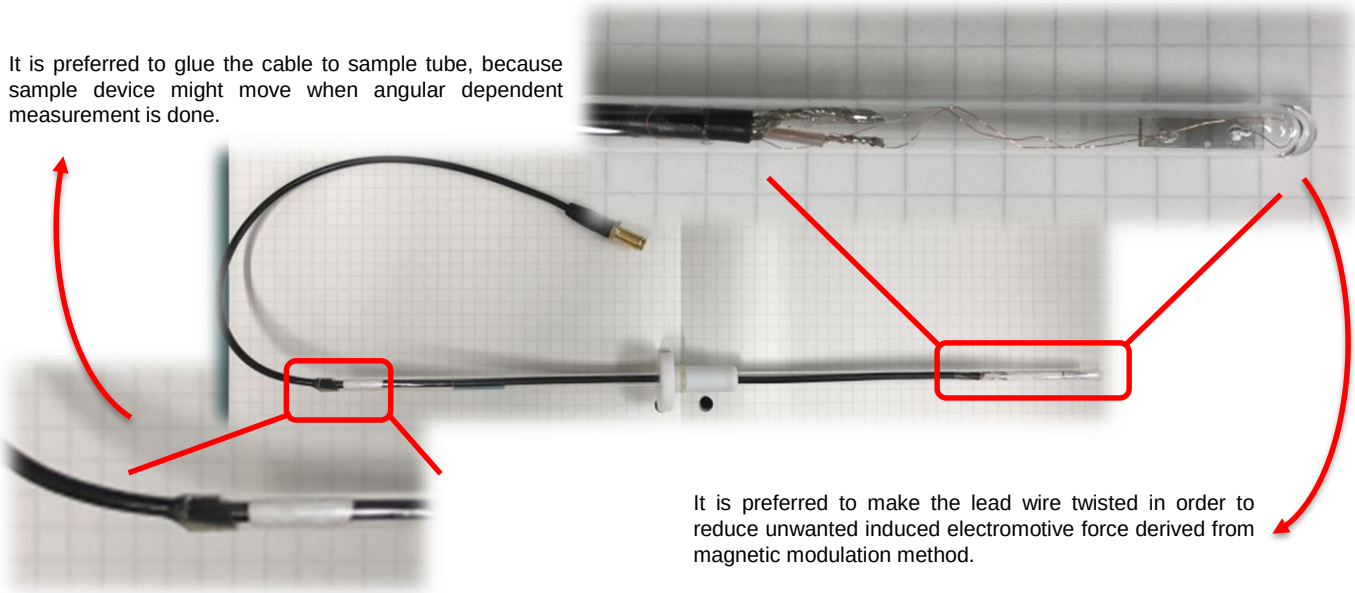
Width of device is desirable of about 3 mm in order to load easily into a sample tube with a diameter of Φ5.

After removing the coating of the lead wire by a chemical agent it is temporarily fixed to both side of thin film device.

The lead wire is glued by a small amount of Ag paste using thin stick.

Fig. 1 An example of gluing lead wire to device.

It is preferred to glue the cable to sample tube, because sample device might move when angular dependent measurement is done.



It is preferred to make the lead wire twisted in order to reduce unwanted induced electromotive force derived from magnetic modulation method.

Fig. 2 An example of fabricating sampling tube for EDMR measurement.

* Measured samples were provided from Dr. Katsuichi Kanemoto of Osaka City University.

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