

ESR measurement parameter ****Magnetic field modulation width****

Product used : Electron Spin Resonance (ESR)

■ Setting of magnetic field modulation width

The ESR measurement employs the field modulation method to observe the signal with good S/N, resulting in the signal being displayed in a differential spectra. Figure 1 shows the ESR signals of the same sample measured by changing the magnetic field modulation width. When the magnetic field modulation width is large, the ESR signal will become large, but waveform will be distorted and the resolution will be reduced. On the other hand, the ESR signal resolution will improve, but the sensitivity will decrease when the magnetic field modulation width is small. Therefore, it is necessary to optimize modulation width according to the sample. Figure 2 shows the observed ESR signal line-widths for various magnetic field modulation widths. There is no change in the ESR line-width within the optimal range of the magnetic field modulation width. The line-width of the ESR signal will match the magnetic field modulation width if the magnetic field modulation width is set larger than the line-width of the original ESR signal. This state is called “over-modulation” condition. The value of the magnetic field modulation width is recommended to set 1/3 or less of the line-width of the original ESR signal.

Set magnetic field modulation width

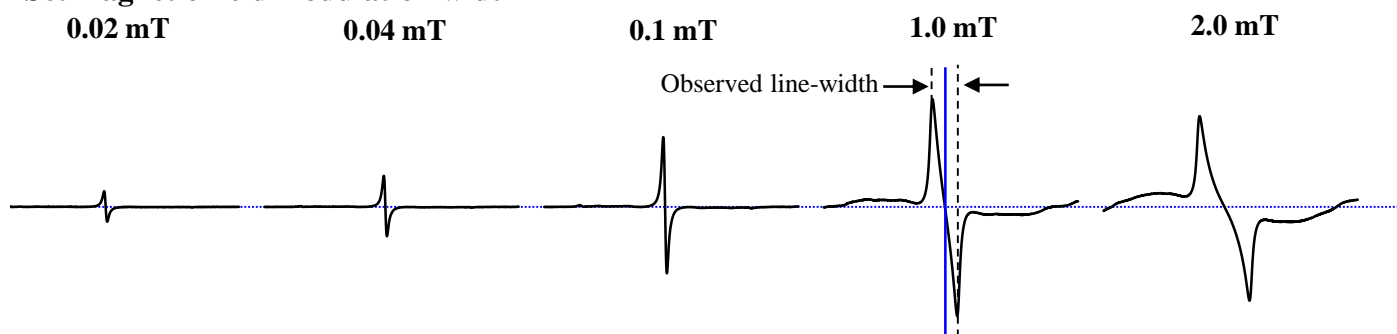


Figure 1. Change in the line-width of the ESR signal with the magnetic field modulation width.

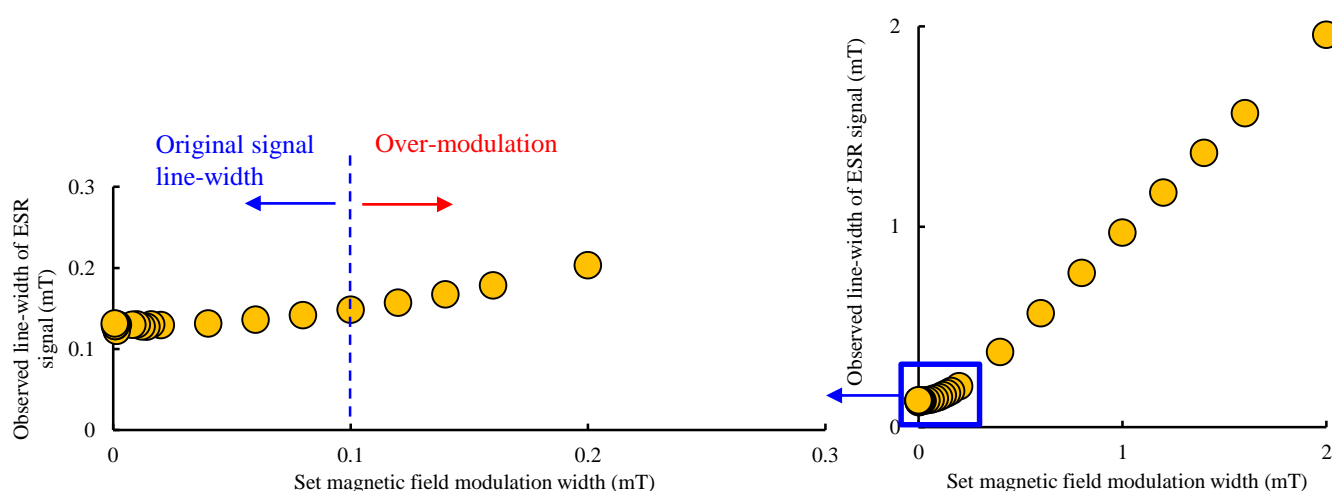


Figure 2. The line-width of the ESR signal with the magnetic field modulation width.

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