Introduction of Loop-Gap Resonator - No. 1

The Loop Gap Resonator for ESR has very high sensitivity because of its excellent B_1 filling factor so is good for measurement of small samples. As the electric field element is generated outside the resonator, it can prevent loss of sensitivity even for solutions which tends to cause dielectric losses. With samples of high mobility, oxygen affinity, or because the relaxation time T_1 is short, adequate saturation is not easily observed with a normal cavity even using strong microwave irradiation. Using this resonator, a saturation curve can be easily obtained even using weak microwave irradiation. It is possible to detect NO radicals from only 3µl of solution of $1x10^{12}$ spins using an X-band ESR system [(1)].

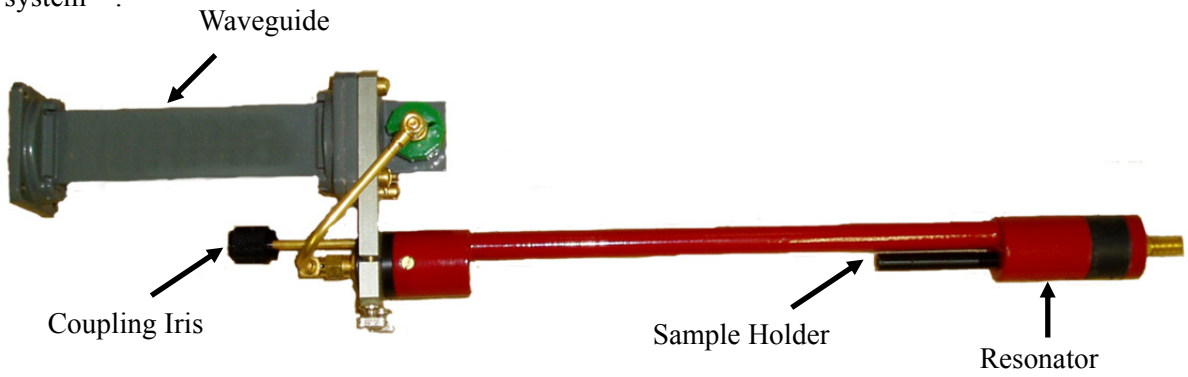

Fig1. Loop-Gap Resonator

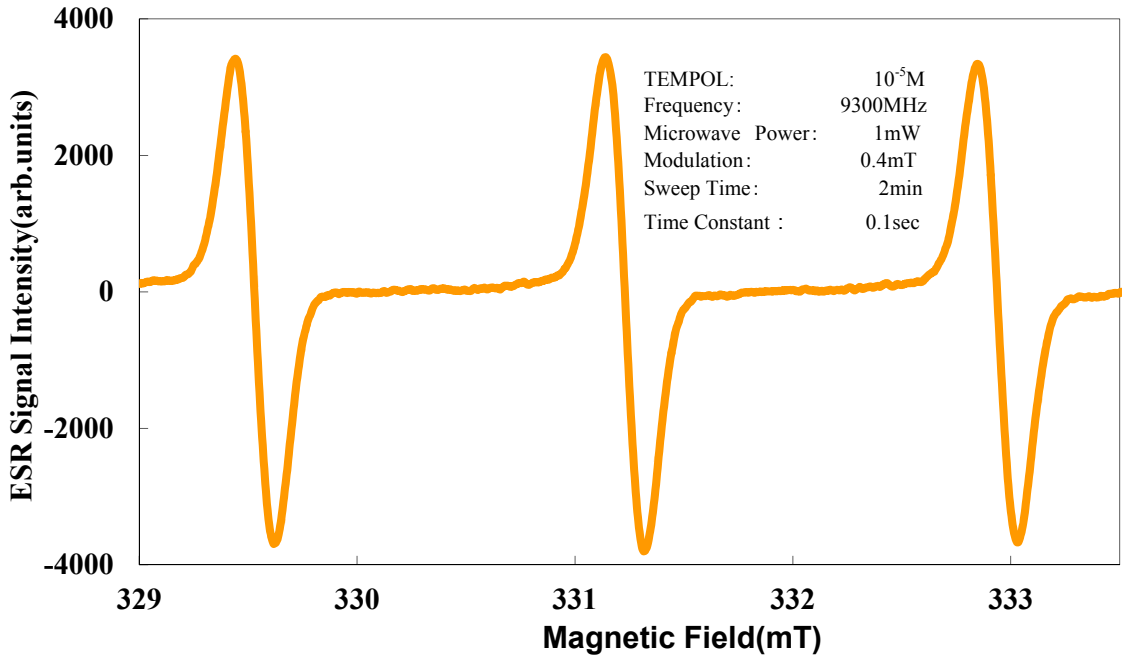

Fig 2.Measurement Example of Tempol Aqueous Solution (aprox.3µl)

Cited Literature

(1) Aaron M. Shafer, Tamas Kalai, Sarah Qiao Bin Liu, Kalman Hideg, and John C. Voss (2004): Site-Specific Insertion of Spin-Labeled L-Amino Acids in Xenopus Oocytes. Biochemistry, Vol. 43, 8470-8482.