ELECTRON PARAMAGNETIC RESONANCE (EPR) DOSIMETRY

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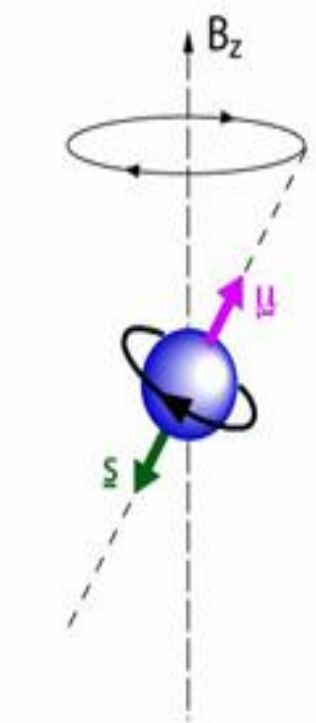
Electron paramagnetic resonance (EPR) dosimetry is a physical method for the assessment of absorbed dose from ionising radiation. It is based on the measurement of stable radiation induced radicals in human calcified tissues (primarily in tooth enamel).

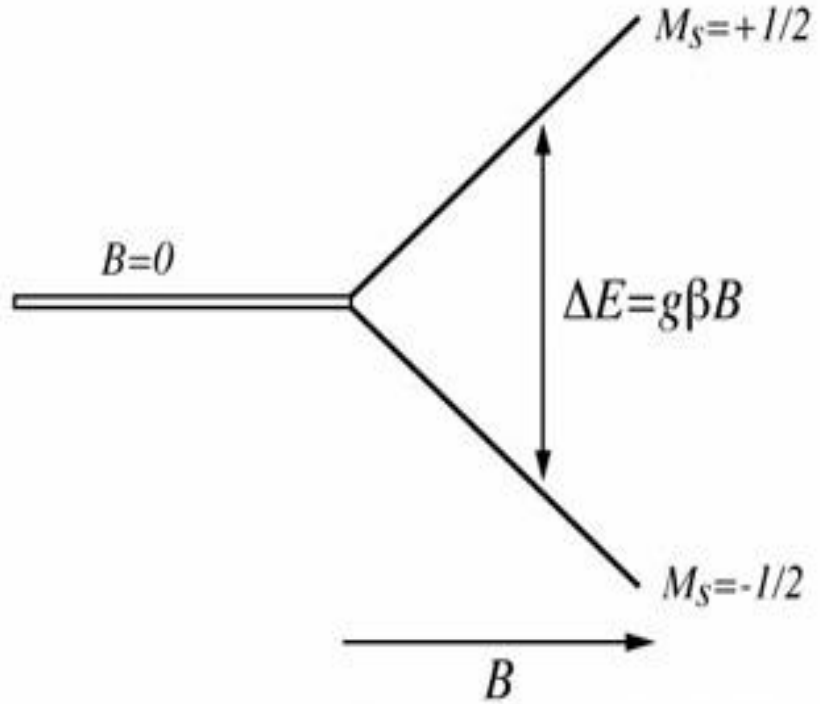
RESONANCE CONDITION

$$h\nu = g\mu_B B$$

- ν is resonance frequency
- h is Plank's constant
- g is the g-factor
- μB is the Bohr magneton
- B is the magnetic field induction

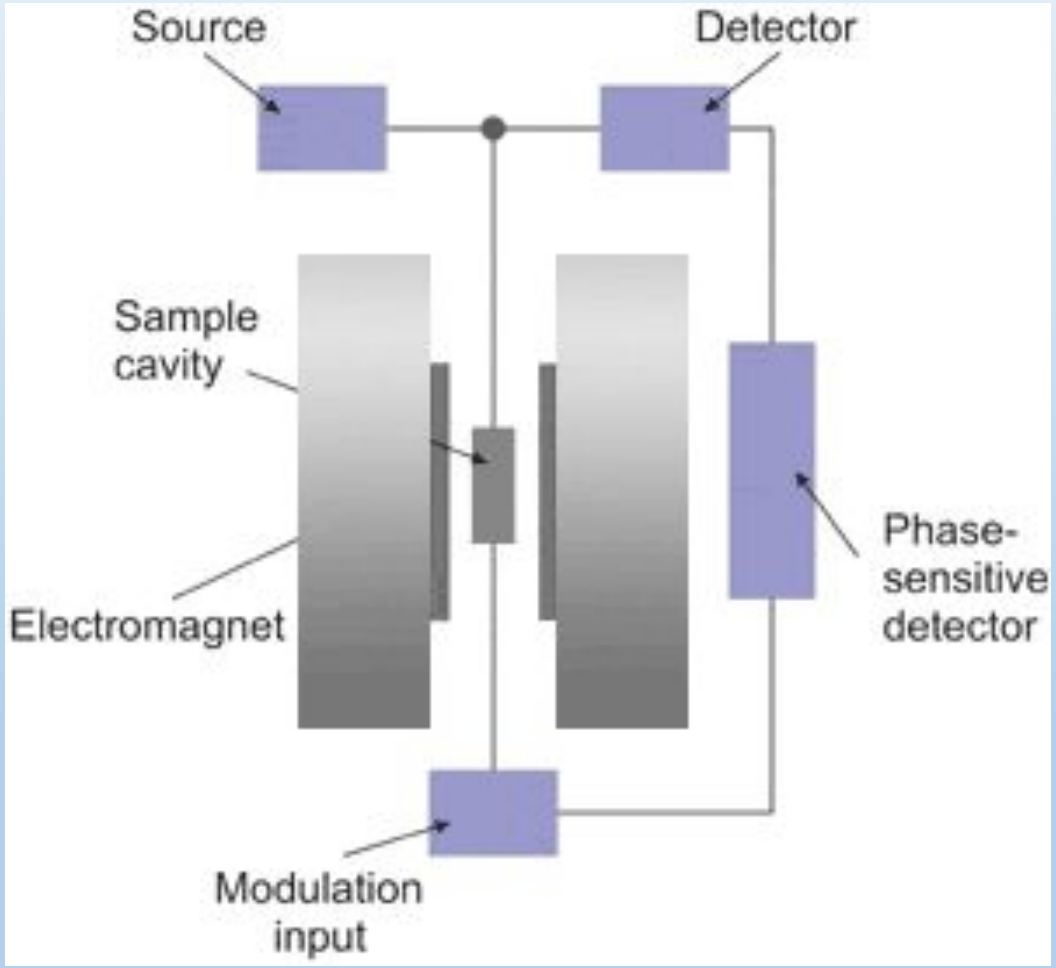


precessing spin



electron energy levels in an applied field

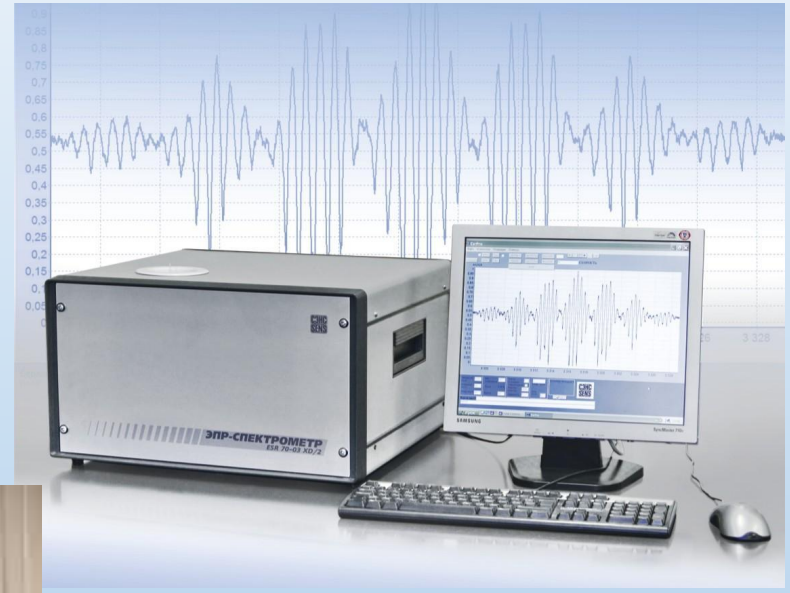
EPR SPECTROMETER



EPR spectrometer «Bruker»

CLASSES OF EPR SPECTROMETERS

- Large research spectrometers
- Middle-class spectrometers
- Small spectrometers



ADVANTAGES AND DISADVANTAGES OF THE EPR METHOD

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- measure the volume of samples;
- dose reconstruction to the distinctive tissues;
- dose reconstruction after long periods of exposure;
- dose reconstruction for many years after the exposure.

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- the difficulty in collecting material for analysis;
- reconstruction of the individual dose is complicated and labour-consuming.

THANKS FOR ATTANTION!!!