

Electron spin resonance (ESR) as a method to estimate the time of blood extravasation in forensic medicine.

Hanna Domek, Leszek Sagan, Jarosław Piątek, Bolesław Gonet

Electron spin resonance (ESR) is known as a dating method and ESR dating was applied successfully in Quaternary geology, anthropology and archaeology. There have been proposed also an interesting attempt of application ESR dating of organic substances utilising paramagnetic degradation products by Miki et al. (Miki, Kai & Ikea, 1987). We have applied ESR spectroscopic method in order to estimate the time after a death or injury using extravasating blood. This method may be of importance as a practical test in forensic medicine. ESR spectrum of the coagulated blood consists of the three signals at $g = 6$, $g = 4,3$ and the strongest at $g = 2,005$. The sharp signal at $g = 2,005$ is due to ascorbyl radical in vitro and it corresponds to the level of vitamin C in vivo. The investigations were performed using the blood of six healthy donors. ESR spectra were recorded as a function of ageing time about 20, 60, and 90 hours after extravasation. The obtained results show a big individual variability among samples and ESR signal dependence on the condition in which the samples were stored (temperature, humidity) and small ESR signal differences in time. We can conclude, that the ESR spectroscopic method is not suitable for examination of blood extravasation.