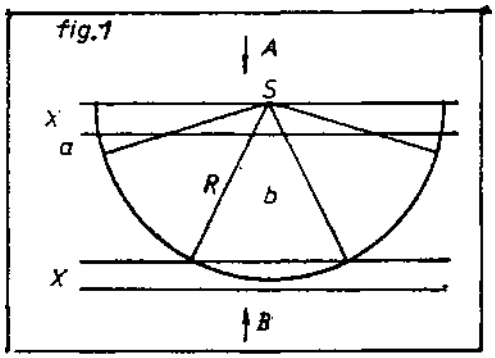
THE POSSIBILITY OF USING CELLULOSE NITRATES IN RELOCALIZATION OF α-RADIATION

J.Vuković, J.Simonović and R.Antanasijević*
Institute of Physics of the Medical School of Belgrade
*Institute of Physics, Belgrade, SFR Yugoslavia

The main problem in applying cellulose nitrates in autoradiography is the impossibility of bringing the preparation and detector (NC) into a close contact in the course of chemical treatment (etching) of the detector or colouration of the preparation. The problem has earlier been solved by a partial separation of the preparation and NC, which have been separately trated and then again brought to a close contact (Fig.1.A).

In this work an essentially different approach to the problem has been made by using a cellulose nitrate of type NC-65 (Milan Blagojević at Lučani) of a very high etching velocity (V_G of about 3 μm/h) as detector (Fig.1.X). An alpha radiographic source was brought into contact with one side surface of the detector, which was etched after exposure, but only from the side opposite to that of the radiographic source application (the process of track etching starts in the site of the highest specific ionization).(Fig.1.B). The detector thickness was larger by several microns than the range of α-particles emitted from radiographic sources. In the concrete case, for the radiographic source use was made of a grid for electronic microscope, onto which a natural uranium layer of a thickness of 300 Å was vacuum evaporated.(Fig.1.S)



Registrated α-tracks:a)method A, b) method B.

Such a method of obtaining a radiographic image from histological preparations makes it possible to use all natural alpha emitters without separating the preparation from the detector. A special advantage of the method is that the detector is etched for a relatively short time interval. This brings about a high transparency of the detector, which is not the case at longer etching times. The etching is shown schematically in Fig. 1.