The fluidity of membrane lipids takes part in regulation of the membrane-bound receptors. The binding activity of the opioid receptors detected by antagonist-naloxone is stabilized by natural fatty acids, acidic phospholipids and ionol (4-methyl-2,6-ditretbutylphenol). To understand the mechanism of spontaneous inactivation of membrane-bound opioid receptors it was studied the changes of lipid microviscosity during incubation of rat brain synaptosomes (at 37°C) in the presence of various effectors such as the natural fatty acids (arachidonic, palmitic and linoleic) and synthetic antioxidants - ionol and phenozan K (potassium salt of 4-hydroxy-3,5-ditert-butyl-phenylpropoinic acid). The lipid microviscosity was studied by EPR-technique on the computerized spectrometer Bruker-200D using two spin-probes: 2,2,6,6-tetra-methyl-4-capryloyl-oxipiperidine-1-oxyl (1) and 5,6-benzo-2,2,4,4-tetra-methyl-1,2,3,4-tetra-hydro-γ-carbolin-3-oxyl (2), preferentially localized in the surface and annular membrane lipids correspondingly. The value of microviscosity was estimated by rotational correlation time (Tc) of spin probes using formula for fast rotated radicals. It was shown that these unsaturated acids increased Tc (2) during incubation time (1h), the effect of linoleic acid is more (20%) than others. The antioxidants ionol and, especially, phenozan K decreased Tc (2). All effectors (but not phenozan K) increased Tc (1) compared with control (linoleic acid - in more extent as well); but the values of this parameter decline exponentially during incubation in all cases. It was obtained a correlation between the changes of Tc (1) and rates of receptors inactivation, which can be described by an empirical equation. It was proposed that destabilization of the opioid receptors caused by increasing lipid fluidity of brain synaptic membranes.