Trace elements play an important role in human body. Thanks to the availability of modern technology, more and more attention is being paid to studying the concentrations of these elements in human tissue with respect to health disorders in people. Strontium is one of such elements. It has not yet been proved that its deficiency may cause serious health problems. However, this element is potentially toxic, especially after prolonged exposure. On the other hand, in low doses it has particularly favourable effects on the bone tissue, particularly in patients suffering from osteoporoses. This is why it has recently become one of the component used in an effective medicine - stronium ranelate – to treat osteoporoses. The aim of this theses was to introduce a method suitable for determining strontium concentrations and to determine Sr in:

a) plasma and serum of patients treated with strontium ranelate

b)serum of children up to the age of one year

c)venous and arterial umbilical blood

d)the liver tissue of laboratory rat

A method of determining Sr in biological matter by means of flame and flameless AAS has been introduced. Plasmatic Sr concentrations in patients treated with strontium ranelate were found at levels from 30 μg/l to 17757 μg/l, urinal residue ranged from 0.17 mg/24 hour to 232 mg/24 hour. Based on the values of Sr serum concentrations, reference limit Sr concentrations were determined for children up to the age of one year. Average concentrations in venous umbilical blood were 54.17 μg/l and in arterial umbilical blood 56.69 μg/l. Average strontium concentrations in the liver were determined at 2.14×10^{-5} µg/mg of moist tissue. On top of that, the concentration of metallothionein in the liver, the protein participating in the metabolism of certain trace elements, was also determined. With regard to the little-documented chronic toxicity of strontium, monitoring its plasmatic concentrations should be introduced in patients treated with strontium ranelate