

## Synthesis by sol-gel route, chemical and biological characterization of hybrid material composed by Fe(II)C and poly( $\epsilon$ -caprolactone)

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### Abstract.

Sol-gel route represents a valuable technique to obtain functional materials, in which organic and inorganic members are closely connected. Imbalance of the iron level in the body causes several diseases. In particular, the low level of iron, during pregnancy, is responsible of the iron deficiency anemia, and even of neurodegenerative diseases. The aim of this work was the synthesis of therapeutic systems, iron (II) based, by sol-gel method. In a SiO<sub>2</sub> matrix were embedded polyethylene glycol (PCL 7, wt%) and ferrous citrate (Fe(II)C 6wt%) for drug delivery applications. Fourier Transform Infrared (FTIR) spectroscopy was used to study the interactions among different components in the hybrid materials. SiO<sub>2</sub>/Fe(II)C/PCL materials have been proposed as valuable antibacterial agents against *Escherichia coli* and *Enterococcus faecalis*.