# 20. MOSSBAUER SPECTROSCOPY AS A COMPLEMENTARY TECHNIQUE OF X-RAY DIFFRACTION TO INVESTIGATE ELECTRODE MATERIALS FOR ALKALI-ION BATTERIES

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Lithium-ion batteries (LIBs) have been widely applied as a power source for portable electronics, stationary energy storage systems, and electric vehicles. Nevertheless, as lithium resources continue to decline worldwide and Li in the Earth's crust is unevenly distributed as minor-metal. Na-ion batteries are considered to be an alternative to Li-ion batteries owing to the natural abundance of sodium. Indeed, Sodium-ion (Na-ion) batteries are expected to become part of the mix of technologies that will meet the challenges of energy storage.

Electrode materials are the most important components in the operation and the performances of Alkali-ion batteries. New electrode materials are required to increase the energy density of Li/Na-ion batteries [1]. Fe based negative electrode materials for Li-ion batteries have been previously investigated to evaluate the electrochemical performances and elucidate the electrochemical reaction mechanisms.

Mössbauer spectroscopy has been applied to a variety of fields including chemistry, physics, geology, biology…. In the domain of energy storage, Mössbauer spectroscopy has been used as a powerful tool to investigate the local electronic and structural properties of electrode materials and to determine their reaction mechanisms during charge and discharge of Li/Na-ion batteries [2]. In this poster, we will show from some selected examples how Mössbauer spectroscopy when used with X-ray diffraction can help to improve the performances of electrode materials for Alkali-ion batteries.

**References**

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