

HYBRID NASICON TYPE BATTERIES MATERIALS SOLID-STATE NMR RESEARCH

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Widely used lithium ion batteries face problems such as the reduction of effectiveness after a long time usage, dendrite and toxic salt formation, complicated disposal. A NASICON type material $\text{NaTi}_2(\text{PO}_4)_3$, made from naturally abundant sodium, is a potential candidate for anode synthesis, of next generation batteries, because of its thermal and structural stability and good ionic conductivity. To analyze how batteries work and why they fail, a reliable spectroscopy method called Nuclear Magnetic Resonance (NMR) is used, to measure and investigate structures of crystalline and amorphous compounds on a molecular scale. By using NMR relaxation filter methods it is possible to create a library of ^{23}Na , ^{31}P and ^1H nuclei spectra and use it to investigate potential batteries alternatives.

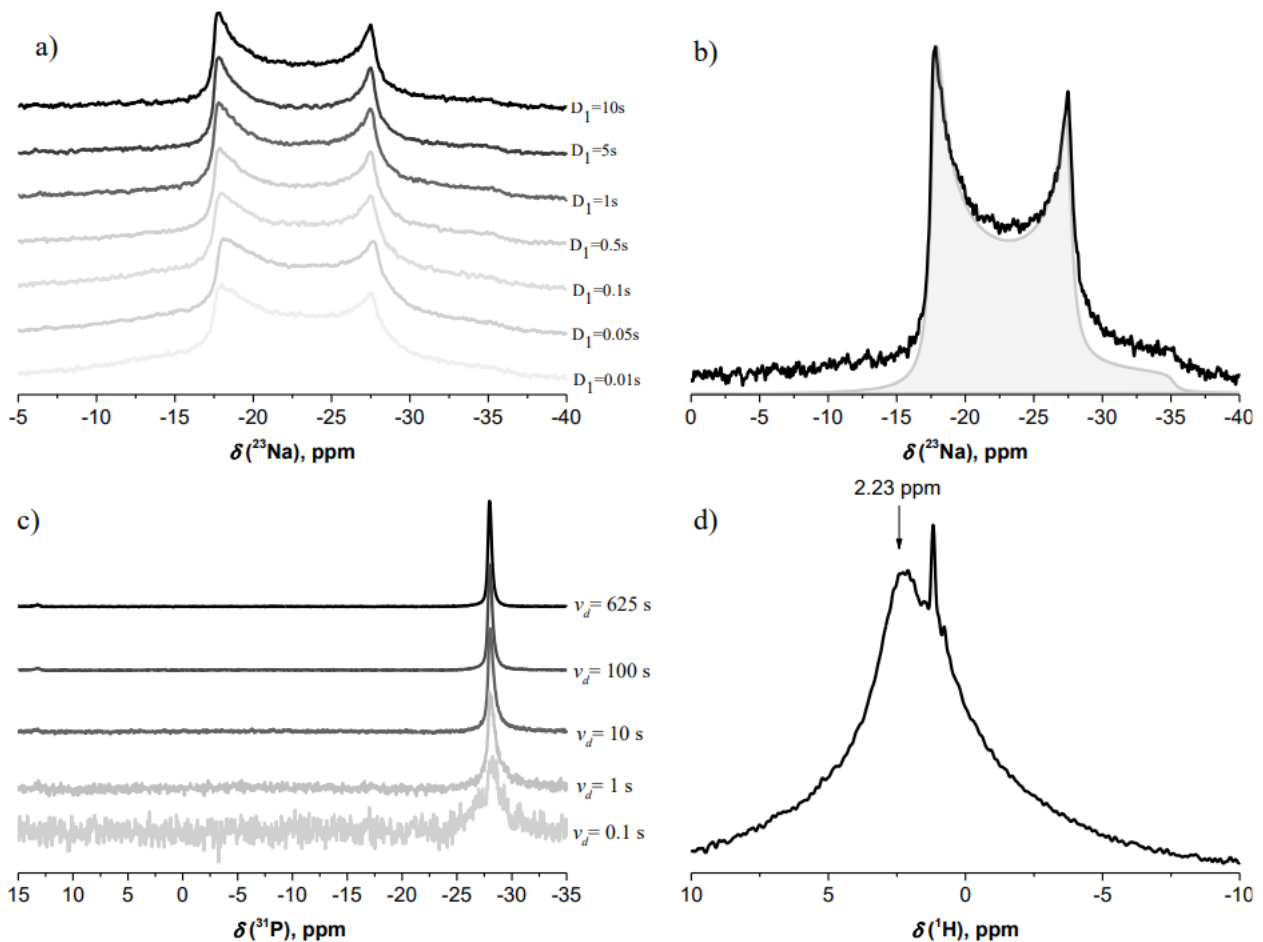


Fig. 1. a) ^{23}Na spectrum with different impulse delay times, b) ^{23}Na spectrum approximated with theoretical curves c) ^{31}P spectrum with different impulse delay times d) ^1H spectrum .