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PiezoForce and Contact Resonance Microscopy Correlated with Raman Spectroscopy applied to a Non-linear Optical Material and to a Lithium Battery Material AARON LEWIS, Hebrew University, GABI ZELTZER, OLEG ZINOVIEV, Nanonics, MICHAEL ROTH, BERNHARD ROLING, AARON LEWIS, Hebrew University, RIMMA DEKHTER, Nanonics — A non-linear optical material (KTP) and a lithium-ion conductive glass ceramic (LICGC) for lithium batteries have been studied with Raman Spectroscopy on-line with Piezo Force and Contact Resonance Microscopies. This is allowed by a unique design of the scanned probe microscopy platform used in these studies and the electrical probes that have been developed that keep the optical axis completely free from above so that such combinations are feasible. The integration allows the investigation of alterations in the strain induced in the chemical structure of the materials as a result of the induction of piezo force. The combination of chemical characterization with both piezo force and contact resonance [1] microscopy allows for the monitoring of structural and ionic changes using Raman scattering correlated with these modalities. In KTP, it has been seen that the largest changes take place in TiO6 octahedral structure symmetric and antisymmetric stretch in the interfaces between the regions of the poling of the structure. In the LICGC, defined Raman changes are observed that are related to the contact resonance frequency. The combination adds considerable insight into both the techniques of Piezo Force Microscopy and Contact Resonance Microscopy.

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