9th Annual Ambient Pressure X-ray Photoelectron Spectroscopy Workhop



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## Investigation on chemical composition of violin varnishes with Ambinet Pressure-XPS

## Content

In the world of violin making, the varnish has been a hot topic of unknown for centuries. Varnish, a mixture of organic material (i.e. oil and tree resin), is applied multiple times on a violin with the intent of protecting the instrument from possible environmental impacts, such as excessive heat/humidity, and physical contact. Although the general chemical composition of varnishes used for violins have been well identified with emerging state-of-art analytical tools, many questions are still left unanswered; especially, when it comes to the analysis of varnish used by the old Italian masters Stradivari and Guarneri "del Gesù". [1,2] So far, no clear correlation has been identified between the varnish and the sound of a violin.

In this presentation, the chemical nature of the violin varnish is explored with ambient pressure XPS. First, to identify the basic composition of the varnish, the varnish prepared on silicon oxide substrates was analyzed. Then, the varnish prepared on spruce substrate was analyzed and compare with the one from silicon substrate. To see the effect of humidity on varnish, the varnish surfaces are exposed to the water pressure of 100 mTorr. The varnish on spruce substrate shows a clear enhancement of C=O bonding under water exposure. The future plan of our study will be also discussed.

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