

Supporting Information

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**Revealing the *sfumato* Technique of Leonardo da Vinci by X-Ray  
Fluorescence Spectroscopy\*\***

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## Supplementary information

**A. List of the analysed paintings with datation according to the *Catalogue des peintures italiennes du musée du Louvre* (Eds Gallimard / Musée du Louvre, 2007)**

	<b>Dimensions (cm)</b>	<b>Chronological information</b>
<i>Annonciation</i>	16 x 60	Ordered to Verrocchio in Florence around 1475-1478
<i>Virgin of the Rocks</i>	122 x 199	Ordered for <i>San Francisco Grande</i> 's church (Milan) in 1483; uncompleted in 1499
<i>Belle Ferronnière</i>	45 x 63	Also named <i>Portrait of a Lady from the Court of Milan</i> ; around 1490-1495 ?
<i>Saint Anne, the Virgin, and the Child</i>	130 x 168	Ordered by Louis XII and Anne de Bretagne; seen in Cloux (Amboise) in 1517
<i>Mona Lisa</i>	53 x 77	Ordered by Francesco del Giocondo around 1503; seen in Cloux (Amboise) in 1517?
<i>Saint John the Baptist</i>	57 x 69	Seen in Cloux (Amboise) in 1517?
<i>Bacchus (originally Saint John the Baptist)</i>	115 x 177	Probable composition by Leonardo da Vinci, around 1511-1515. Seen in Cloux (Amboise) in 1517?

Table S1: Description of the painting from Leonardo da Vinci preserved in the Louvre museum.

### **B. Discussion on the influence of lead content in the glaze layer on the determination of its thickness**

The thicknesses uncertainty is mainly due to possible errors in the layer model. As an example, for the painting layers, 80 % wt of pigment can be considered as an average value; for the glaze lead content, 5 % is an average value. It is impossible to simulate the data with content in lead higher than 8%.

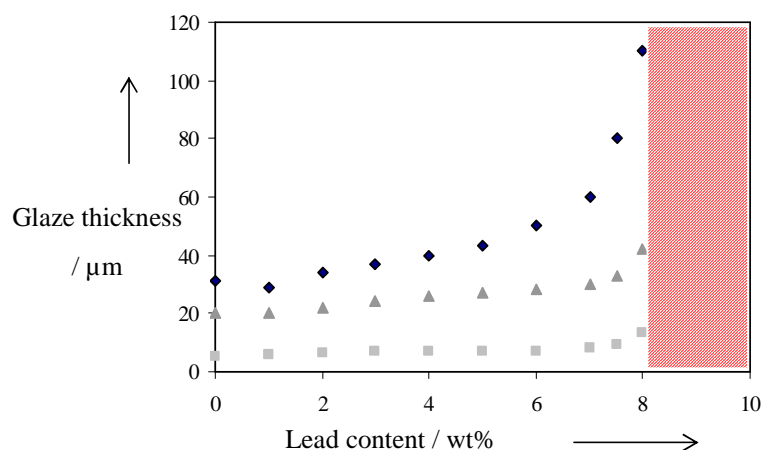


Figure S1: Lead content influence on the glaze thickness for the Child's face in 'Saint Anne, the Virgin and the Child'.

C. Results of the analysis of the Virgin's face in the *Virgin on the rocks* painting preserved in the Louvre museum.

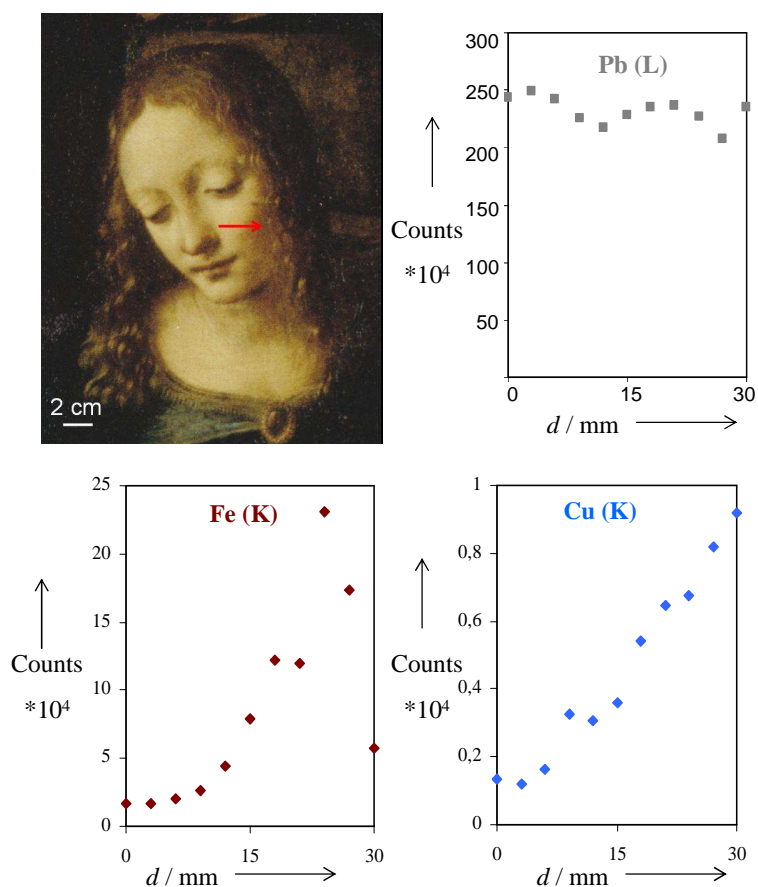


Figure S2: Evolution of the X-ray lines from Pb, Fe and Cu, from a light area to the darkest area. The slow and simultaneous increase of the copper and iron signals shows that these chemical elements belong to the dark layer.

D. Setup for the analysis by XRF

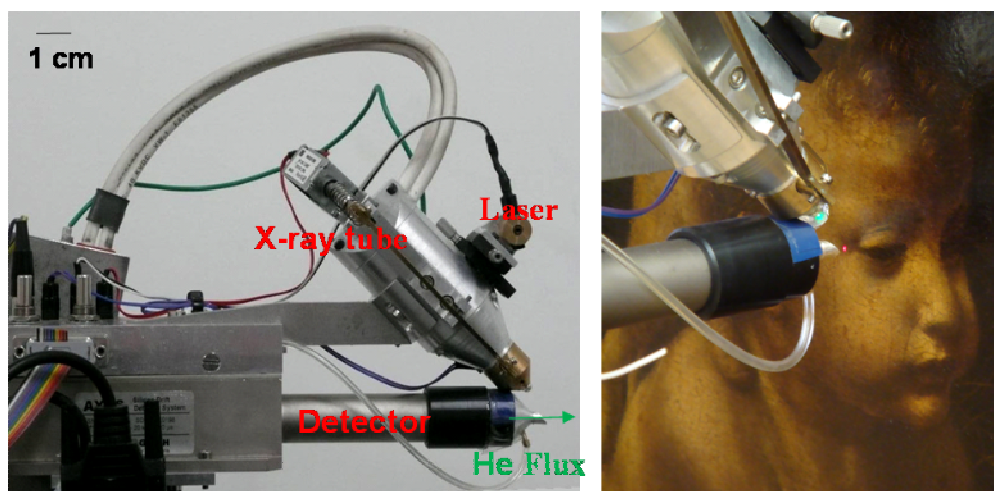


Figure S3 : XRF setup and detail during the analysis of the *Saint Anne, the Virgin and the Child* painting in the Louvre museum