Piloting an integrated art & chemistry field trip at the Philadelphia Museum of Art

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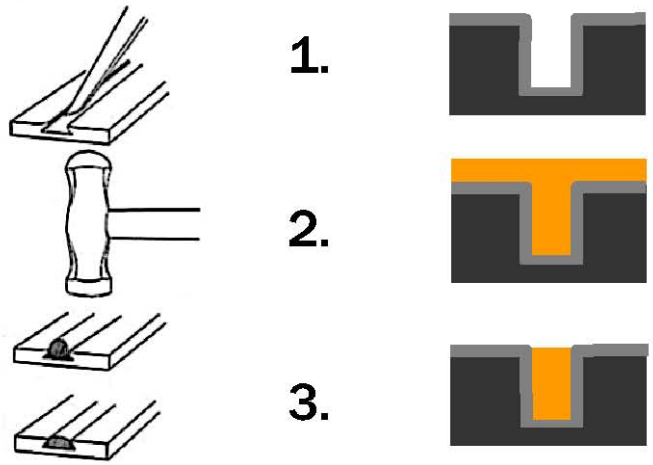
Damascening: a metalworking technique since medieval times

Medieval age ⟶ Silicon age

Persian Helmet. c. 1850
Artist/maker unknown.
from the collection of the Philadelphia Museum of Art
1877-90



1. *Patterning the substrate*
2. *Applying/Plating the metal*
3. *Planarization*

http://www.me.gatech.edu/eml/image/cmp02.jpg

High school chemistry classes' field trip to the Museum

Increasing performance of protective clear coatings for conserving metalwork at the Philadelphia Museum of Art

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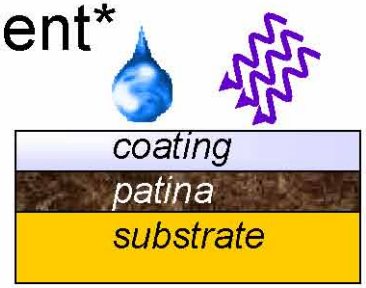
Chemical targets for coating improvement*

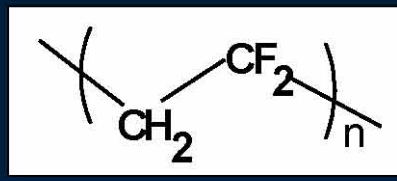
- Increase UV stability
- Increase hydrophobicity
- Reduce hygric swelling



* Gebhard, M.S. *Macromolecular Symposia*, **2002**, 187, 771-80.

Research strategy: collaborate with industrial chemical companies

- Evaluate new products in development
- Provide feedback based on analytical and field testing
- Modification of commercial products



New PVDF (polyvinylidene fluoride) based coating from Arkema Inc. evaluated *in situ* PMA restoration project

Bronze light grilles, *Tiffany & Co. 1927, before*

after sandblasting, patinating & coating