

# EINLADUNG

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# VORTRAG

von

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## **The Identification of Visible Residue by Archaeometry**

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Vortragssaal EA1 (Erdgeschoss)

## The Identification of Visible Residue by Archaeometry

### Abstract

As one of the most important aspects of biological archaeology, analysis of ancient residue is of great significance in archaeology research, which could provide much potential information of ancient society and human activity. Archaeological residue presents two forms: visible residue and absorbed residue. Generally, there are two kinds of visible residue: solid and liquid residue, the former includes mainly carbohydrate, lipid and protein, and the latter includes fermented beverage, plant beverage, soup and so on. Depending on different characters of samples, techniques and methods of physics, chemistry and biology could be used for qualitative and quantitative analysis.

In this paper, Infrared Spectroscopy, ELISA and proteomics are applied to some solid visible residue, which come from Subeixi Site (BC500-300) and Xiaohe Tomb (BC1650-1450), Xinjiang Uygur Autonomous Region. The results confirms that there are certain protein of cattle, goat or sheep milk in both of these two samples, which means that these residue should be dairy products. Compared to other research methods, proteomics has high resolution for milk of different ruminant species, being more sensitive to milk protein and more resistant to contamination.

Also, ion chromatogram was used to identify the origin of liquid preserved in one bronze ware “ding” containing also some cattle bones, excavated from Qiaojiayuan tomb site in the late period of Warring States Period (BC475-221). Ion chromatogram can quantify the contents of monosaccharide, organic acids, amino acids and inorganic anion. Results showed that the liquid contained extremely higher nitrate radical, lower chloride ion and sulfate radical than underwater. It was deduced that the liquid was bone soup and the protein was degraded completely to nitrate radical after long bury.

## Curriculum Vitae

**Dr. Yimin Yang** – studied scientific communication and computer science at the University of Science and Technology of China (USTC), Hefei city, Anhui Province  
Master-PhD-studies at USTC, Doctor in Archaeometry, especially Ru porcelain, blue and white porcelain  
Lecturer (Archaeometry) at the Graduate University of Chinese Academy of Sciences (GUCAS) since 2005  
Associate Professor (Archaeometry) at the Graduate University of Chinese Academy of Sciences (GUCAS) since 2008

## RESEARCH INTEREST

1. Ancient residue analysis, including ancient Chinese medicine, cosmetic, wine, ink, carbonized material, salt residue etc.
2. Tool marks analysis for ancient jade through three-dimensional reconstruction by micro CT and digital microscope.
3. Ancient Ceramics and glass.

More than 20 papers on ceramics, glass, residues, pigments and jade tool marks