

Analysis

Research into the composition of two black materials from the art work *Los Zorios*.

Martinez	At the request of:	Maite
Julio Gonzalez, Spain		IVAM, Centre
Oosten	Researchers:	Drs. Thea B. van
	Project number:	2006-010
Zorios	Documentation file:	Report Los
	Object number:	3250

Amsterdam, March 2006

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INTRODUCTION

The art work 'Los Zorios' was made by the Italian artist Gilberto Zorio in 1995. The work is an installation with movement and sound. It was acquired in 1997 by IVAM, The Centre Julio Gonzalez. The artwork has inventory number: 1997.216-A-1.

Two black (rubber like) materials are part of the art work. One of the black materials is shiny and flexible and corresponds to the crucible. The other is matt and cracked, and has lost its flexibility, and corresponds to the tube of compressors. The cracked matt material was constantly subjected to air and pressure.

For the conservation of the art work two samples were taken and the following questions are asked:

What is the composition of the two black materials?
 Why is one of the materials cracked and matt, while the other is shiny and flexible?

INVESTIGATION

The two samples were investigated using Fourier Transform Infrared Spectroscopy (FTIR). FTIR spectra were recorded using a Perkin Elmer spectrum 1000 combined with a Golden Gate, single Reflection diamond ATR unit.

RESULTS

In Table I the results are given.

Table I. Composition of the two samples

<i>Object no</i>	<i>Sample no</i>	<i>Condition</i>	<i>Appearance</i>	<i>FTIR analysis</i>
3150-1	1	Good condition, no cracks, flexible	Shiny, black coloured	Silicon rubber
3150-2	2	Bad	Matt , black	Ethylene/butene

		condition, cracks, not flexible	coloured	rubber (EBR)
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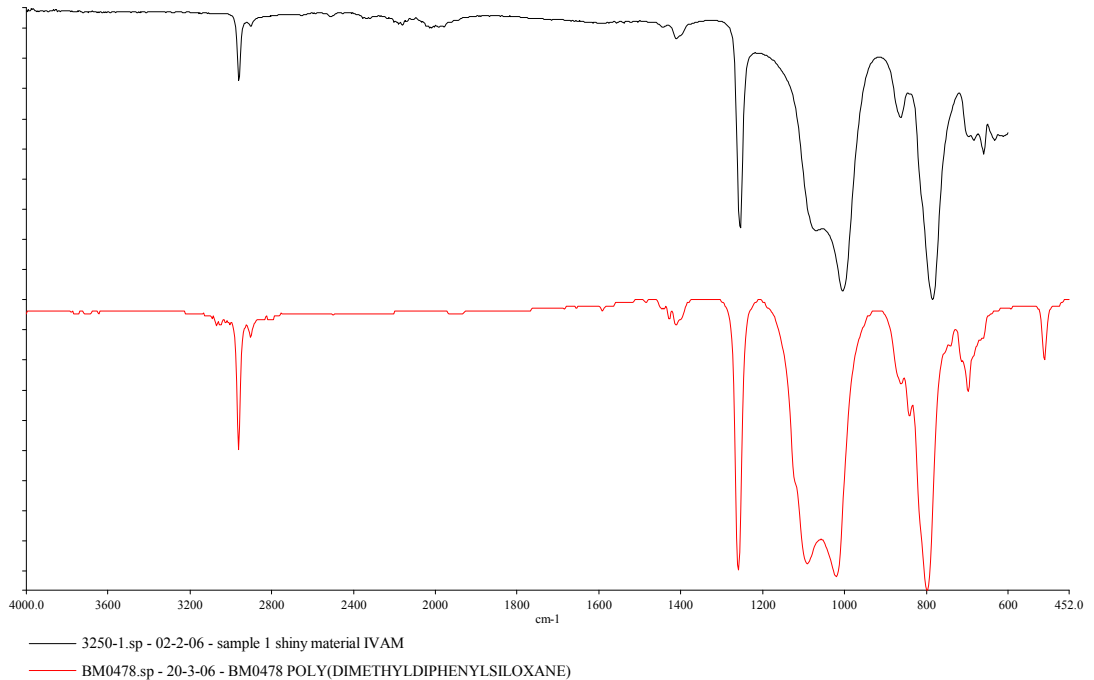
CONCLUSIONS and DISCUSSION

The black shiny flexible material (sample 1) is made of silicon rubber. The black rubber material is in a good condition due to the fact that silicon rubbers show excellent weatherability. No oxidation has occurred.

The cracked matt material (sample 2) is made of Ethylene/Butene Rubber (EBR) rubber. Some filling material and calcium carbonate is present. Like natural rubbers also ethylene/butene rubber is easily oxidised due to environmental circumstances such as oxygen, ozone, light and temperature. Imparted stress, as present in the work of art, has accelerated the ageing of the black material of sample 2, obvious on the cracks on the surface of the material.

FTIR research into the composition of a black shiny flexible material from <i>Los Zorios</i> made by Gilberto Zorio	
Object: Black flexible material	Sample number: 3250-1
Reason for sampling: Composition	Project number: 2006-010
Date sampling: January 2006	Object number: 3250
Performed by: Thea van Oosten	Documentation : 2006/007
Apparatus: Perkin Elmer Spectrum One	File name FTIR: ftir3250-1.doc
Number of scans: 40	File name Word: 3250-1.doc
Method: Reflection Diamond ATR unit	Date of analysis: February 2006

Spectrum



Black spectrum: sample 1 shiny material

Red spectrum: reference material silicon rubber

Result:

The infrared spectrum of the black shiny flexible material from the Art work of the artist Gilberto Zorio shows the same absorption bands as a reference spectrum of silicon rubber.

Specific absorption bands of silicon rubber are: broad absorption bands at 1092 and 1006 cm^{-1} (Si-O vibration), sharp absorption at 2962 cm^{-1} (from C-H vibration), 1273 cm^{-1} (CH vibrations), and one at 786 cm^{-1} .

Conclusion:

The black shiny flexible material is made of silicon rubber. The black rubber material is in a good condition due to the fact that silicon rubbers show excellent weatherability.

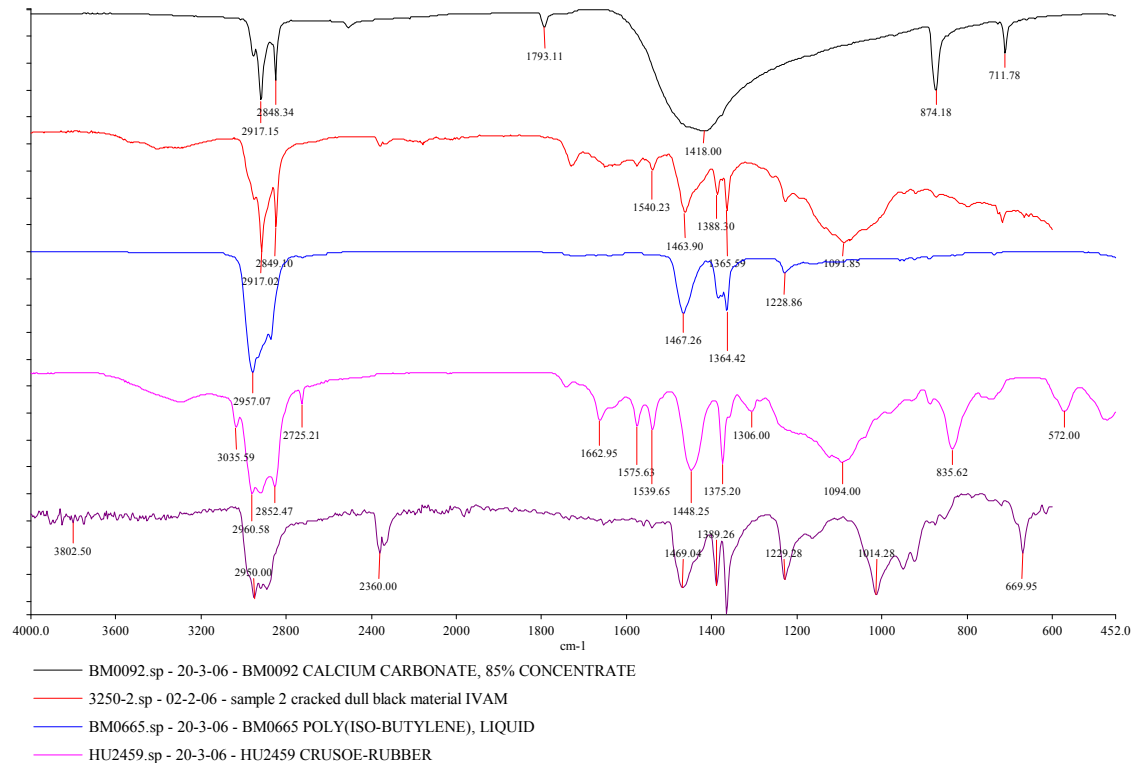
Amsterdam, March 2006

Thea B. van Oosten, senior researcher ICN

FTIR RESEARCH INTO THE COMPOSITION OF A CRACKED, MATT, BLACK MATERIAL FROM "LOS ZORIOS" MADE BY GILBERTO ZORIO

Object: Cracked, matt, black material	Sample number: 3250-2
Reason for sampling: Composition	Project number: 2006-010
Date sampling: January 2006	Object number: 3250
Performed by: Thea van Oosten	Documentation : 2006/007
Apparatus: Perkin Elmer Spectrum One	File name FTIR: ftir3250-2.doc
Number of scans: 40	File name Word: 3250-2.doc
Method: Reflection Diamond ATR unit	Date of analysis: February 2006

Spectrum



Result:

The infrared spectrum of the cracked, matt material from the Art work of the Italian artist Gilberto Zorio shows the same absorption bands as the reference spectra of ethylene/butene rubber material and some calcium carbonate and other filling material.

Specific absorption bands of butane are: 2917, 2849 cm⁻¹(from C-H vibration), 1540, 1463, 1388, 1364 cm⁻¹ (CH vibrations).

Filling materials have infrared absorptions around 1094 cm⁻¹ and calcium carbonate around 1418 cm⁻¹

Conclusion:

The cracked matt material is made of Ethylene/Butene Rubber (EBR) rubber. Some filling material and calcium carbonate is present. The material is cracked due to the influence of oxygen, ozone, light and temperature.

Amsterdam, March 2006

Thea B. van Oosten, senior researcher ICN

Analysis

1.- INTRODUCTION

In this report we show the results of the analyses carried out on a small sample of paint from the work entitled *Los Zorios* by the artist Gilberto Zorio. The sample is of the black material of the wineskin. The analyses were requested by Maite Martínez, Head of the Restoration Department of the IVAM.

The aim of the analyses was to identify the materials presents on each layer of the sample. In the report there is a table showing the results of the study in detail, the most significant graphs obtained from the tests performed and the conclusions related to the questions posed in the request for the study.

2.- DESCRIPTION OF THE SAMPLE

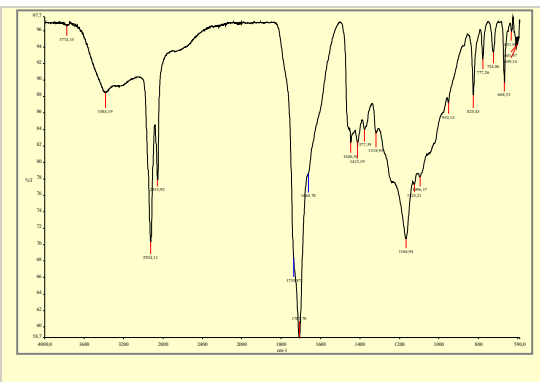
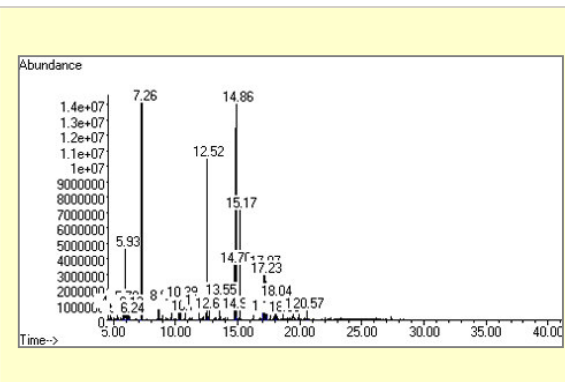
<i>NO. 1</i>	<i>Dark coloured soft black material</i>
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3.- STUDY TECHNIQUES & CHEMICAL TESTS

- 3.1.- Fourier transform infrared spectroscope – attenuated total reflection unit (FTIR-UATR)
- 3.2.- Gas chromatography– mass spectrometry (GC-MS)
- 3.3.- Fine layer chromatography (TLC)

4.- RESULTS

NO. 1.- Soft black material

Description of sample		Soft dark coloured material		
Analysis report				
Meted separating sample	for the	Complete sample	Analysis techniques	FTIR-UATR, GC-MS & TLC
				
Identification of the material		The materials identified are: drying oil mixed with another greasy compound we can associate with lanoline		
		The dark colorant can be associated with anilines		
Observations: No compounds associated with vaseline found				

Madrid, 7 Abril 2006

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