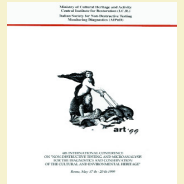


A NEW APPROACH IN THE USE OF OXYGEN SCAVENGER FOR INSECT ERADICATION IN MUSEUMS

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Introduction

This poster focuses on results of tests carried out on a painting at different humidified levels with various type of oxygen scavengers, used for insect pest treatment of museum objects. Comparisons are made between traditional oxygen absorber type Mitsubishi Ageless Z or Atco LH and Mitsubishi RP-A agent.

RP-A agent is promising since oxygen, some corrosive gases and moisture can be absorbed simultaneously.

Aim

Insect eradication requires drastic parameters especially for killing larvae and eggs:

- λ Oxygen free environment (< 0,1%)
- λ Temperature (> 18°C)
- λ Gas barrier film with low oxygen and moisture permeabilities

Maintaining a steady RH level is a major concern which can be achieved with the RP-A agent.

Experimental

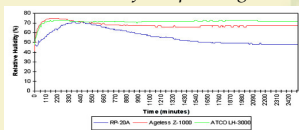
The experiments were carried out to enable comparisons to be made between RP-20A, Ageless Z-1000 and Atco LH3000 following two protocols:

- λ painting encased in the envelope at low hygrometric environment
- λ "humidified" painting

Results

Comparison between the painting "humidified" and "non humidified" during treatment.

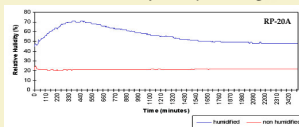
"Humidified" painting



Percentage rate of RH increase inside the envelope over elapsed time

Oxygen scavengers	Initial RH %	Max RH %	Elapsed time mn
Ageless Z-1000	44	75	140
Atco LH-3000	48	73	150
RP-20A	45	71	440
RP-20A non humidified painting	21	25	5

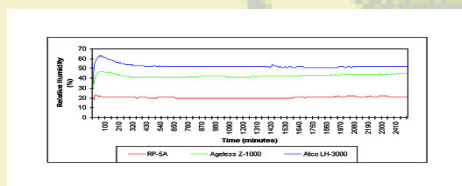
"Non humidified" painting



Percentage threshold of relative humidity over elapsed time

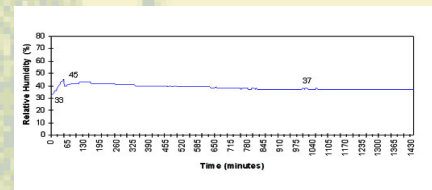
Oxygen scavengers	Initial RH %	Elapsed time mn
Ageless Z-1000	68	640
Atco LH-3000	71	650
RP-20A	48	2050
RP-20A non humidified painting	21	35

"Low" RH environment

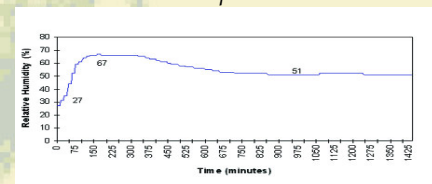


Case Study

Oil on canvas



Wood panel



Conclusions

- λ The moisture released by the traditional oxygen scavengers, Ageless Z and Atco LH, remains acceptable and could be improved by fine tuning the encasing technique except in the case of wood panel.
- λ The cost effectiveness of the use of the RP-A agent must be taken into account.
- λ They are more suitable for small size paintings.
- λ The prospect of shifting the relative humidity level back to the initial level of the insect pests treatment is promising.
- λ Tests carried out at a low RH environment confirm the RP-A ability of maintaining a steady RH all the way through the treatment.
- λ The RP-A agent should have a future in static anoxia treatment as it allows relative humidity increase to be maintained at a low level.

Discussion

Ageless Z - Atco LH

- λ Rate of RH increases rapidly (up to 31% for Ageless Z) in a short period of time (~ 650 mn)
- λ RH difference ~ 24% between beginning of treatment and threshold

RP-A agent

- λ A much slower RH increase
- λ Longer elapsed time (x 3)
- λ RH comes back to almost the initial level
- λ Small amount of water vapour released in a short period of time.

Suppliers

RP-A agent and Ageless Z: Manufactured by The Mitsubishi Gas Chemical Company, 5-2, Marunouchi 2-chome, Chiyoda-ku, Tokyo 100, Japan; available from The Conservation by Design, 60, Park Road West, Bedford, UK.
Atco LH: Manufactured and available from Standa Industrie, 14050 Caen, France.

Materials used:

A semi-translucent 0.12mm triplastic film model Filmpack 1193, volume of the envelope 6 litres
T °C & HR % data logger λ Duration of tests: 2 days maximum