

June 1, 2000

BITUMINOUS
TECHNOLOGIES

RESEARCH / DEVELOPMENT / TECHNICAL SERVICES

Mr. Roger Rowles
Pavement Rejuvenation Technologies Group
114 Clifton Avenue
Sharon Hill, PA 18079

Re: Investigation to Determine Quantity of Coal Tar Sealer Rejuvenator Retained in Asphalt Pavement After Five Years

Project P182000

We received three asphalt concrete samples sent by the Pavement Rejuvenation Technologies Group, they were identified and labeled as follows:

- A) Untreated Asphalt Core, 0.00 gal/yd²
- B) Asphalt Core (untreated) to be treated with 0.05 gal/yd² coal tar sealer rejuvenator in the lab.
- C) Asphalt Core ? gal/yd² - Treated with coal tar sealer rejuvenator approximately five years ago.

It is understood all three samples were taken from an existing parking lot with the same environmental weathering. In addition it is assumed the asphalt mix would be considered identical for all three samples.

The surface area for core B was calculated and a corresponding amount of coal tar sealer rejuvenator was applied to equate to 0.05 gal/yd² applied. The sample was placed outside for a period of seven days to cure (allow the solvent to evaporate).

Next the samples were wet saw cut to remove the top 0.25" of core. Then 3 to 4 gram samples were removed from the center of each sample, 0.25 inch thick. These samples were sent to Indspec Chemical Corporation for determination of the aromatic index by FT-IR technique.

Indspec Test Results are attached.

The conclusion is 0.02 gal/yd² of coal tar sealer rejuvenator was left remaining in the pavement after five years.

It should be noted the precision and bias for this procedure is not determined.

Please contact me if you have any questions.

Sincerely yours,



Kevin Hardin
VP Materials and Research

Phone (813) 623-3941 / FAX (813) 626-4103
5201 Causeway Blvd. / P.O. Box 75437 / Tampa, FL 33675

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INDSPEC

Chemical Corporation



1010 William Pitt Way, Pittsburgh, PA 15236 • Telephone 412-826-3666 • FAX 412-826-3699

May 19, 2000

Mr. Kevin Hardin
Bituminous Technologies
P. O. Box 75437
Tampa, FL 33675

Dear Mr. Hardin:

RE: Pavement Samples (4046)

Your samples of asphaltic concrete core specimens have been examined by FT-IR techniques, as requested in your letter dated May 8, 2000. The analysis focused on determining if there is coal tar-based sealer rejuvenator in the sample labeled "? gal/yd²", and to estimate its concentration if present.

Portions of each sample were extracted with carbon disulfide. The isolated CS₂ extracts were examined by FT-IR for qualitative characterization and also for determining the aromaticity index (Ia), which is a measure of the relative amounts of aromatic / aliphatic hydrocarbon structures.

The results are as follows:

<u>Sample Description</u>	<u>A. L. No.</u>	<u>Ia and Qualitative Analysis</u>
"0.00 gal / yd ² " (baseline; no coal tar)	32634	Ia = 0.12. The extracts consist of oxidized asphalt – no coal tar hydrocarbons are detected.
"0.05 gal / yd ² " (coal tar treated)	32635	Ia = 0.23. The extracts, as expected, are a mixture of oxidized asphalt and "heavy" coal tar hydrocarbons.
"? gal / yd ² " (the unknown)	32636	Ia = 0.16. These extracts are definitely a mixture of oxidized asphalt and "heavy" coal tar hydrocarbons, but are lower in coal tar than AL-32635.

May 19, 2000
Mr. Kevin Hardin
Bituminous Technologies
2.

As you can see, the unknown sample unquestionably contains coal tar-based hydrocarbons. The data suggests an approximate coal tar sealer concentration of 0.02 gal / yd².

Copies of the qualitative FT-IR spectra are enclosed for reference.

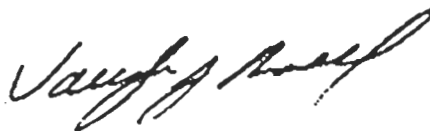
Every precaution has been taken to ensure the accuracy of the results. However, the information in this final report is provided subject to the condition that INDSPEC Chemical Corporation will not be liable for any loss or damage resulting from use of the data.

Should the results of the testing be considered for any advertising or promotional purposes, it should be noted that INDSPEC Chemical Corporation does not allow the use of its name to be contained in advertising and/or promotional material.

If we can be of further assistance, please do not hesitate to contact us.

Sincerely,

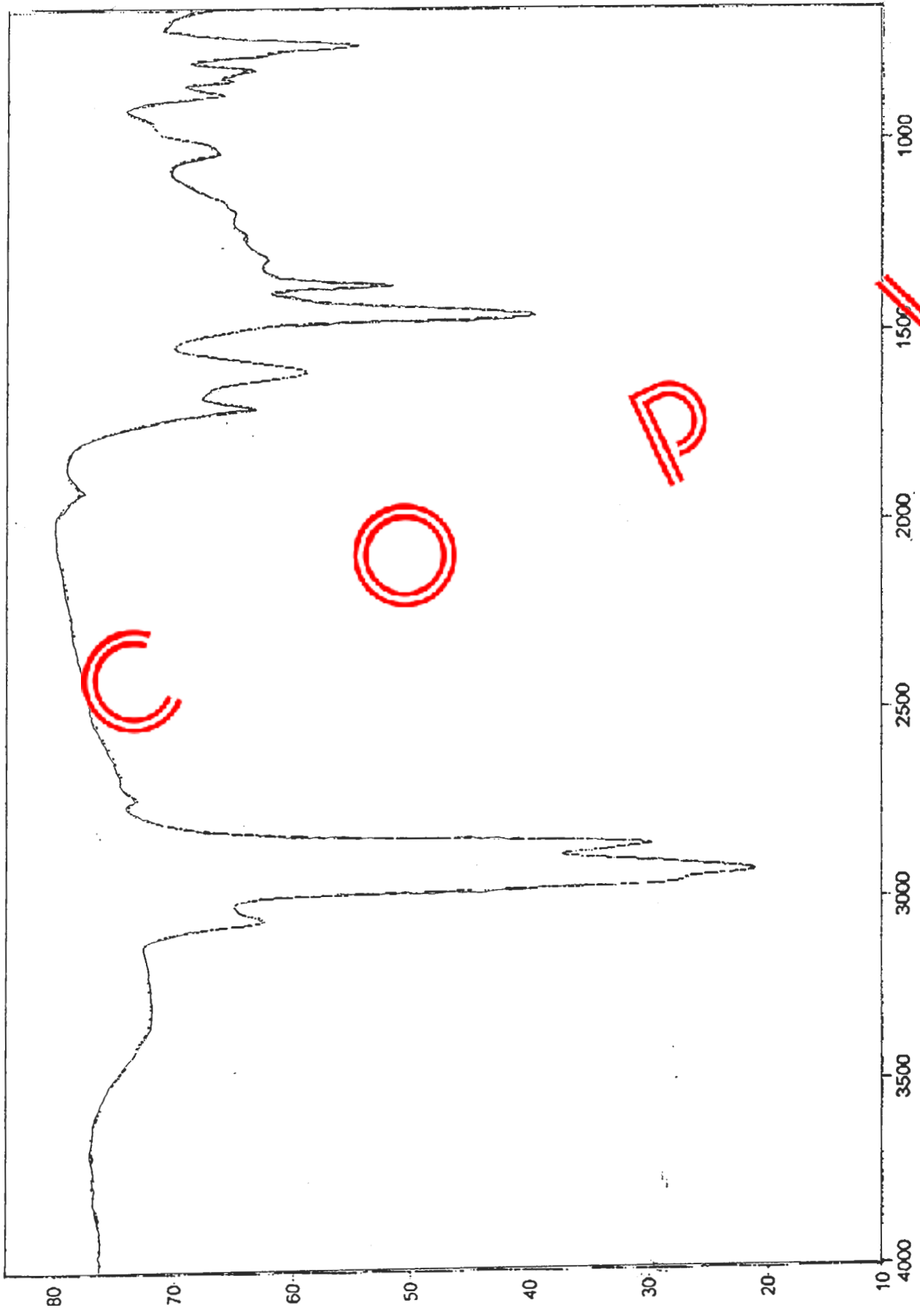
INDSPEC CHEMICAL CORPORATION



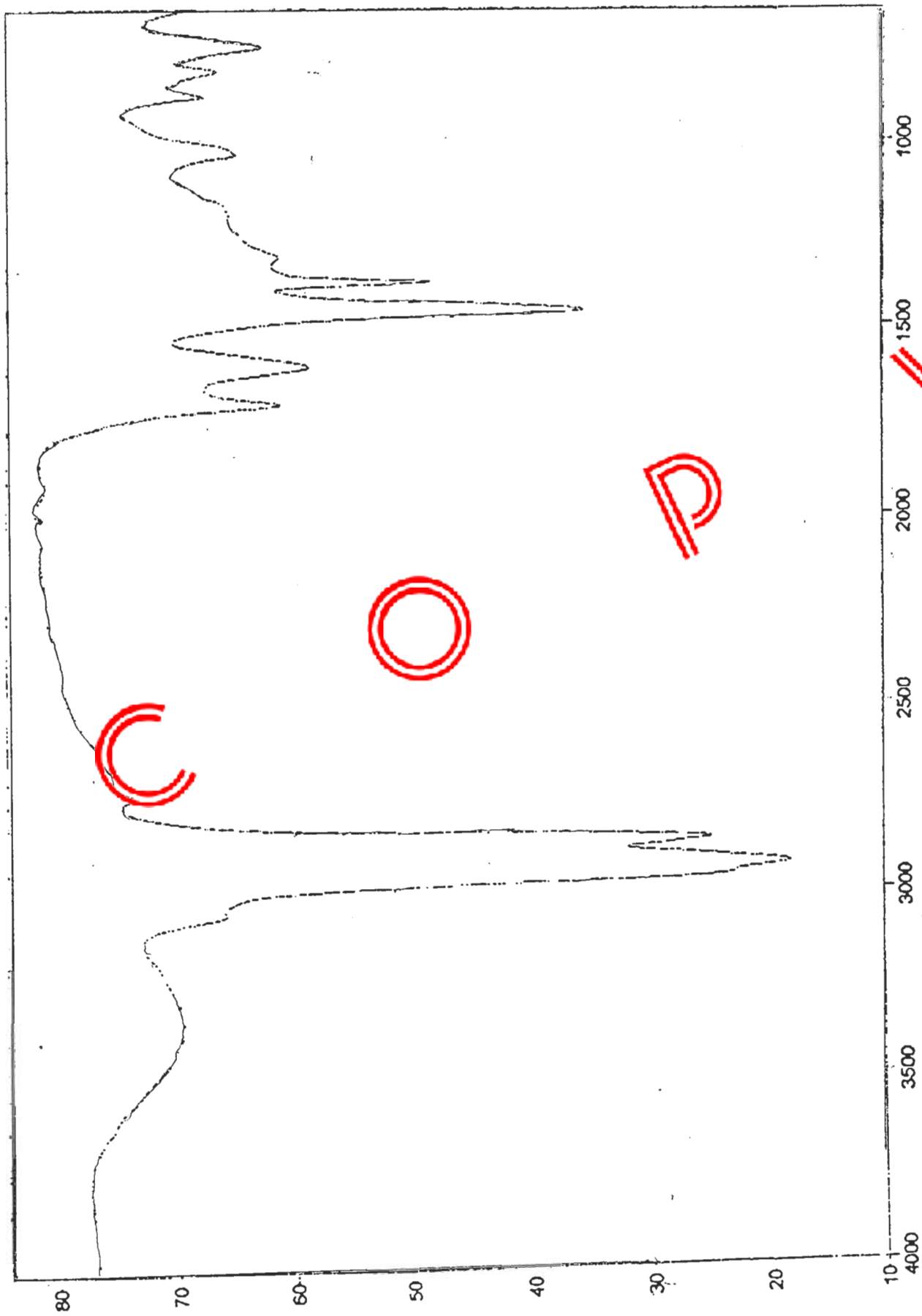
Vaughn J. Romell
Senior Scientist
Absorption Spectroscopy

Enclosures

cc: Mrs. B. B. Buchner



Transmittance / Wavenumber (cm-1) Number of Scans= 16 Apodization= Strong
File # 2 : AL-32635 5/19/00 11:05 AM Res=8 cm-1

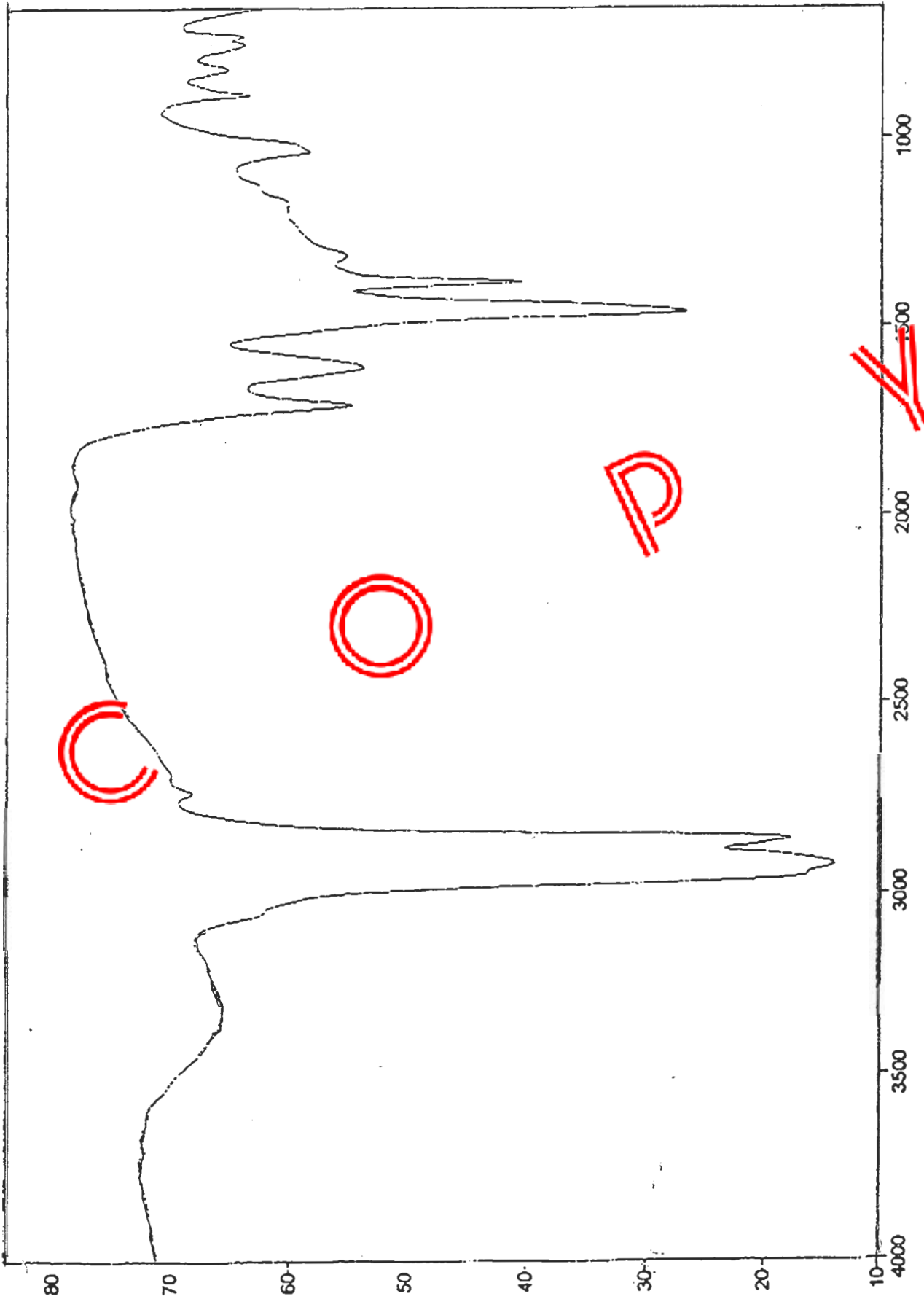


Number of Scans= 16 Apodization= Strong

5/19/00 11:14 AM Res=8 cm-1

Transmittance / Wavenumber (cm-1)

File # 2 : AL-32636



Transmittance / Wavenumber (cm-1)

Number of Scans= 16 Apodization= Strong