Biphenyl Process Samples

St. Louis Organic Research

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Whelan Klemme
Anniston, Alabama

Dear Whelan:

We were glad to learn that your Aerograph Gas Chromatographic Instrument is performing smoothly for you. Now that you've had a successful "launching", we have done some method development work for your lab. Attached are some GLC tracings and instrument conditions for analyzing biphenyl process samples. Under separate cover we are sending a packed column, a bottle of column packing, and a portion of the biphenyl sample we used in establishing the instrument conditions. No internal standard is used in these methods.

With your constant temperature instrument it is necessary to have two different column temperatures. The high temperature analysis is needed to show up distinct quaterphenyl areas and enable you to analyze for terphenyls and quaterphenyls but not biphenyl itself. Biphenyl is not well resolved from the solvent at the high temperature and poor results would be obtained. Operating the instrument at the high temperature is very hard on the equipment, so caution George Jones not to leave the instrument at the high temperature any longer than absolutely necessary. Quaterphenyls have essentially the same detector response as terphenyls. From the high temperature analysis you can determine the terphenyls to quaterphenyls ratio.

A lower temperature is required to resolve the biphenyl from the solvent. However, at the lower temperatures, the quaterphenyls are not distinct areas and they cannot be determined under these conditions. The lower temperature method can be used to analyze for biphenyl and terphenyls. Both methods require a high injection block temperature, and the septums will need to be replaced frequently.

Point out to George Jones that the area correction factors can be established for terphenyls relative to the biphenyl just as we established area correction factors relative to the triphenylmethane internal standard we used when he was working with us here. Using the combination of results obtained at each of the two temperatures, the entire analysis for biphenyl terphenyls and quaterphenyls can be determined. From the ratio of terphenyls to quaterphenyls determined at the higher temperature and the percentage of terphenyls determined at the lower temperature the percentage of quaterphenyls can be determined. Of course, the biphenyl and terphenyls percentages determined at the lower temperature must be corrected for the

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percentage of quaterphenyls in the sample.

After you receive the column and have traced out chromatograms of the biphenyl sample we are sending with the column, wire us and let us know if the column and instrument are performing properly or not. If difficulties are encountered and you want to talk with us directly by phone, first wire us as to the date and approximate time you plan on calling so we can have copies of the chromatograms before us and will not lose time locating them with you waiting on the phone.

Our best regards to you and to George Jones.

R. L. McKinley

E. M. Emery

Attachments

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