ROY COOPER
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MICHAEL S. REGAN
Secretary
MICHAEL SCOTT
Director

NORTH CAROLINA
Environmental Quality

October 2, 2020

Ms. Christel Compton
The Chemours Company FC, LLC
22828 Hwy 87 W
Fayetteville, NC 28306

Re: Isomer Response

Dear Ms. Compton,

In response to the August 26, 2020 letter, the July 17, 2020 Isomer Report, and the technical call on September 22, 2020, DEQ recommends additional LC/MS/MS experiments be performed prior to running environmental samples. The purpose of these experiments is to definitively show not only which isomers are present in the standards and samples but also to confirm if other isomers are present, even at low levels, or if they are entirely absent.

The July 17, 2020 report does not provide sufficient analytical assessment of the linear isomers (PFMOPrA and PFMOBA). While the report does show that the dominant species present are likely to be the branched isomers (PMPA and PEPA), additional work should be conducted to show whether or not the linear isomers are also present in the analytical standards and environmental samples. The LC/MS/MS experiments performed should be repeated with method improvements that allow for better chromatographic separation and instrument detection of the four individual analytes of interest.

Method improvements are recommended for this investigation only. Routine analysis of the isomers would not require implementation of all suggested method changes for the isomer evaluation. However, some of the method changes may help with future routine analysis. Chemours' August 26, 2020 letter states an intention to analyze a set of samples to establish if there are any false positives. It is recommended that further method development be conducted prior to analyzing these samples so it is clear that the linear isomers are sufficiently assessed by these methods. Recommended method improvements are listed below. More detailed information, including a proposed path forward, is described in the attached supporting information. In summary:

1) Use four separate solutions for the four analytical standards rather than mixtures.
2) Use sufficient concentrations of standards for strong peaks (minimum instrument response of 10^6) to determine any impurities in each of the four standards.
3) Optimize the mass spectrometer settings for the linear isomers when analyzing for them.
4) Chromatographically resolve (separate) each isomer pair, and monitor multiple MRM transitions for each peak to determine individual isomer presence/absence.

Review Certificates of Analysis from Wellington and publications by Strynar et al. 2015 and Song et al. 2018 for examples of LC/MS/MS methods for analysis of these isomers. Once these methods are demonstrated for characterizing the 4 analytical standards, the optimized methods for each compound should be applied to investigating the potential presence of linear isomers in the environmental samples using linear calibration standards.

Please let us know of any questions.

Sincerely,

Michael E. Scott
Director, Division of Waste Management
NC DEQ

North Carolina Department of Environmental Quality | Division of Waste Management
217 West Jones Street | 1646 Mail Service Center | Raleigh, North Carolina 27699-1646
919.707.8200