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PNNL-32872

Using Separation-Enhanced Isotope Ratio Mass Spectrometry

CRADA 525 (PNNL 78164)

May 2022

Tim Bays

Los Alamos National Laboratory
Coordinating Research Council

U.S. DEPARTMENT OF ENERGY

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Abstract

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Abstract

Stable isotope ratio measurements using IRMS have been shown by LANL to be effective for tracking co-processed biogenic carbon, with results approaching that of AMS. The lower cost of an IRMS may enable deployment to refineries improving access and analysis turnaround times (≤ 2-hours), and by extension data that can allow process optimization to maximize renewable carbon in desired refinery products. This work will apply chemical separation approaches as part of the IRMS analyses, enabling biogenic carbon tracking in fuel product streams by boiling point range, by chemical class, or even by compound. This work will show IRMS to be at a minimum as reliable and comparable to AMS, by using separations to improve sensitivity at low blend ratios and enable refinery process optimization through onsite analysis.

Pacific Northwest National Laboratory

902 Battelle Boulevard
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