PROTOCOL FOR THE DETERMINATION OF THE SPECIATION OF HYDROCARBON EMISSIONS FROM OIL REFINERIES

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April 2004

Published by
ENERGY INSTITUTE, LONDON
The Energy Institute is a professional membership body incorporated by Royal Charter 2003
Registered charity number 1097899

The Energy Institute gratefully acknowledges the financial contributions towards the scientific and technical programme from the following companies:

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ISBN 0 85293 405 X
Published by the Energy Institute

Further copies can be obtained from Portland Customer Services, Commerce Way,
Whitehall Industrial Estate, Colchester CO2 8HP, UK. Tel: +44 (0) 1206 796 351
email: sales@portland-services.com

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ACKNOWLEDGEMENTS

This protocol was produced on behalf of the Energy Institute by the National Physical Laboratory (NPL) under the guidance of the Energy Institute's Emissions Working Group and the Environment Agency for England and Wales. This protocol has been produced in cooperation with UKPIA's Refinery Emissions Working Group (WG15).

Members of the Steering Committee for the project include:

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SCOPE

This protocol provides a methodology for determining the fractional speciation of hydrocarbon emissions from oil refineries. It can be used in association with the EI *Protocol for the estimation of VOC emissions from petroleum refineries and gasoline marketing operations* to provide speciated hydrocarbon mass emission estimates.

The results are reported as the mass fraction of the annual hydrocarbon emissions in each of the following categories:

- total unsaturates and total saturates broken down by C number (to sum to 100% by weight);
- benzene;
- toluene;
- xylene (all isomers);
- ethylbenzene;
- total aromatics;
- 1,3-butadiene;
- ethene;
- propene;
- butenes (all isomers);
- pentenes (all isomers);
- 1,2 dichloroethane;
- 1,1,2,2-tetrachloroethane.

This protocol has been developed and validated during a series of measurement campaigns conducted at two UK oil refineries, under summer and winter conditions. These trials demonstrated that the approach provides a cost effective and robust methodology.

It is based on boundary fence sampling using diffusion tubes. The protocol includes details on measurement of physically separated areas of the refinery. However, where the refinery boundary is irregular in plan or borders on other large emission sources, there may be a need to use professional judgment and review, with the relevant environmental inspector, the optimum location of samplers.

Although it is believed that this protocol will assist the user in estimating the speciation of hydrocarbon emissions from an oil refinery, the Energy Institute cannot accept responsibility, of whatsoever kind, for any damage arising from or otherwise occurring as a result of the application of this protocol.