

THE INSTITUTE OF PETROLEUM

Speciation of VOC Emissions from UK Oil Refineries:  
Part 1 - Overview



THE INSTITUTE OF PETROLEUM

Speciation of VOC Emissions from UK Oil Refineries:  
Part 1 - Overview

February 2002

Published by  
**The Institute of Petroleum, London**  
A charitable company limited by guarantee

Copyright © 2002 by The Institute of Petroleum, London:  
A charitable company limited by guarantee. Registered No. 135273, England

All rights reserved

No part of this book may be reproduced by any means, or transmitted or translated into  
a machine language without the written permission of the publisher.

ISBN 0 85293 345 2

Published by The Institute of Petroleum

Further copies can be obtained from Portland Press Ltd. Commerce Way,  
Whitehall Industrial Estate, Colchester CO2 8HP, UK. Tel: +44 (0) 1206 796 351  
email: [sales@portlandpress.com](mailto:sales@portlandpress.com)

# CONTENTS

	Page
Acknowledgements .....	vii
Executive summary .....	ix
<b>1 Introduction</b> .....	<b>1</b>
<b>2 Background</b> .....	<b>3</b>
<b>3 Literature survey</b> .....	<b>5</b>
<b>4 Measurement survey</b> .....	<b>7</b>
4.1 Background .....	7
4.2 Measurement strategy .....	7
4.3 Adsorbent tubes .....	8
4.4 Pumps .....	8
4.5 Exposure times and pumping rates .....	8
4.6 Sampling locations .....	8
4.7 Chemical analysis .....	8
<b>5 Results</b> .....	<b>9</b>
<b>6 Conclusions</b> .....	<b>13</b>
<b>7 Recommendations</b> .....	<b>15</b>



# ACKNOWLEDGEMENTS

This report was produced for the Institute of Petroleum by Howard Rudd of AEA Technology plc under the guidance of the IP's Emissions Working Group and in cooperation with UKPIA's Refinery Working Group (WG15).

Members of the IP's Emissions Group include:

Brian Smithers (Chairman)	BP
Maurice Catherall	BP
Alan Green	Conoco
John Martin	Total Fina Elf





# 1

## INTRODUCTION

At the end of 1999 the Institute of Petroleum was asked by UKPIA, on behalf of the refineries based in the UK, to provide a means through which emissions of Volatile Organic Compounds, reported annually as part of the Environment Agency's Pollution Inventory, could be speciated. In 2000 the Institute commissioned AEA Technology, under the guidance of the IP's Emissions Working Group, to investigate the possibility of producing a generic protocol to enable refineries to speciate VOCs. This was to be used in conjunction with the IP's existing Protocol for the Estimation of VOC Emissions from Petroleum Refineries and

Gasoline Marketing Operations.

The report details the work undertaken to achieve the above and draws conclusions from the results obtained. It is presented in three parts, each bound under a separate cover. This document is Part 1, and presents an overview of the work carried out and of the results obtained. Part 2 presents the findings of the literature survey, the objective of which was to identify existing species data for refinery VOC emissions. Part 3 describes the detailed results of the measurements carried out at nine UK refineries.