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## **APPENDICE**

**A-1 Calculation of selectivity to other hydrocarbons****% Selectivity of gas fraction and liquid fraction**

$$\% \text{ Selectivity of X} = \frac{\text{concentration of X} \times 100}{\text{total concentration of fractions}}$$

$$\text{Concentration of X} = \frac{b \times c}{a}$$

a = Peak area of X in standard gas or liquid fraction

b = % molar of X in standard gas or liquid fraction

c = Peak area of X in sample products



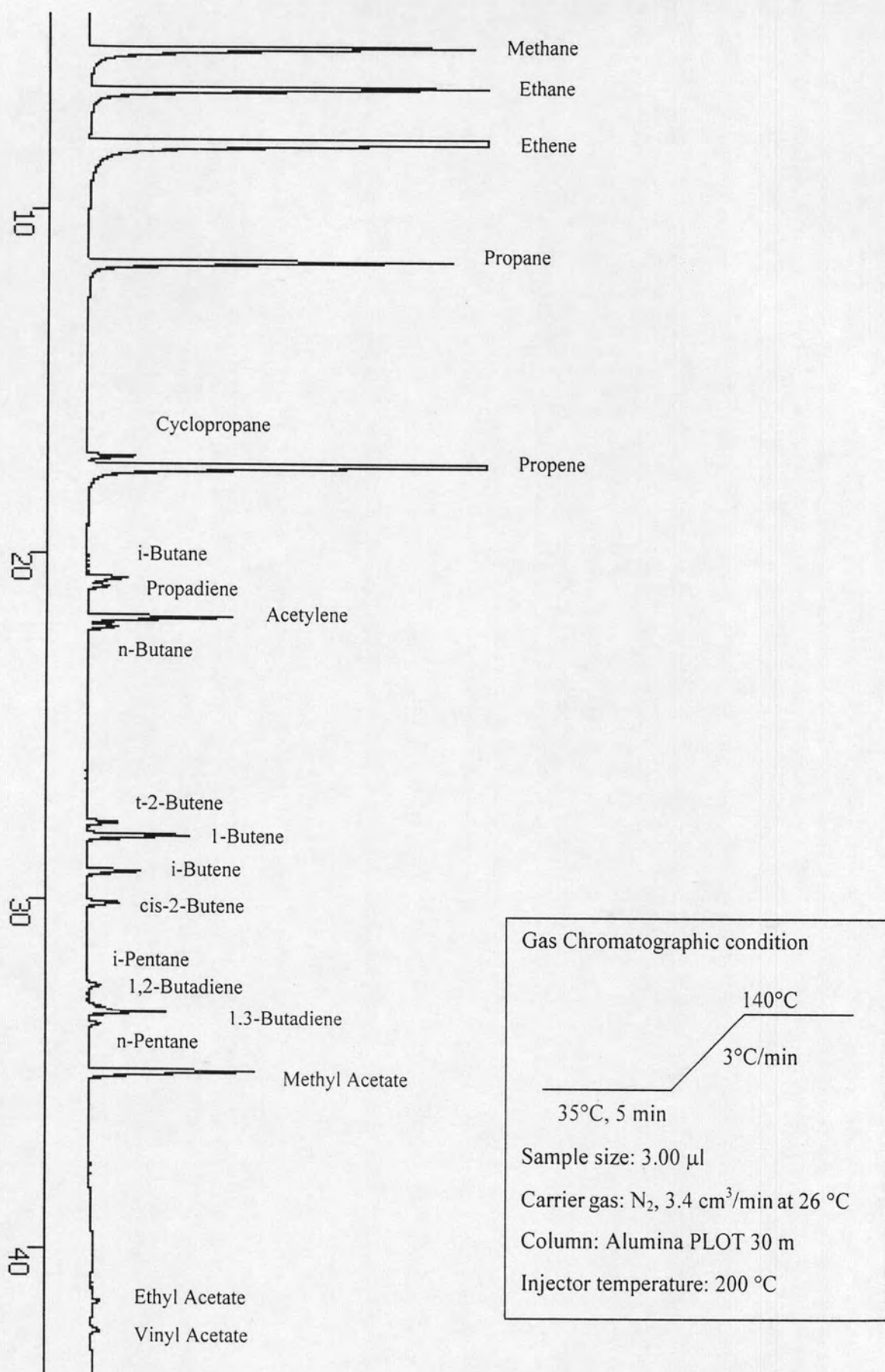
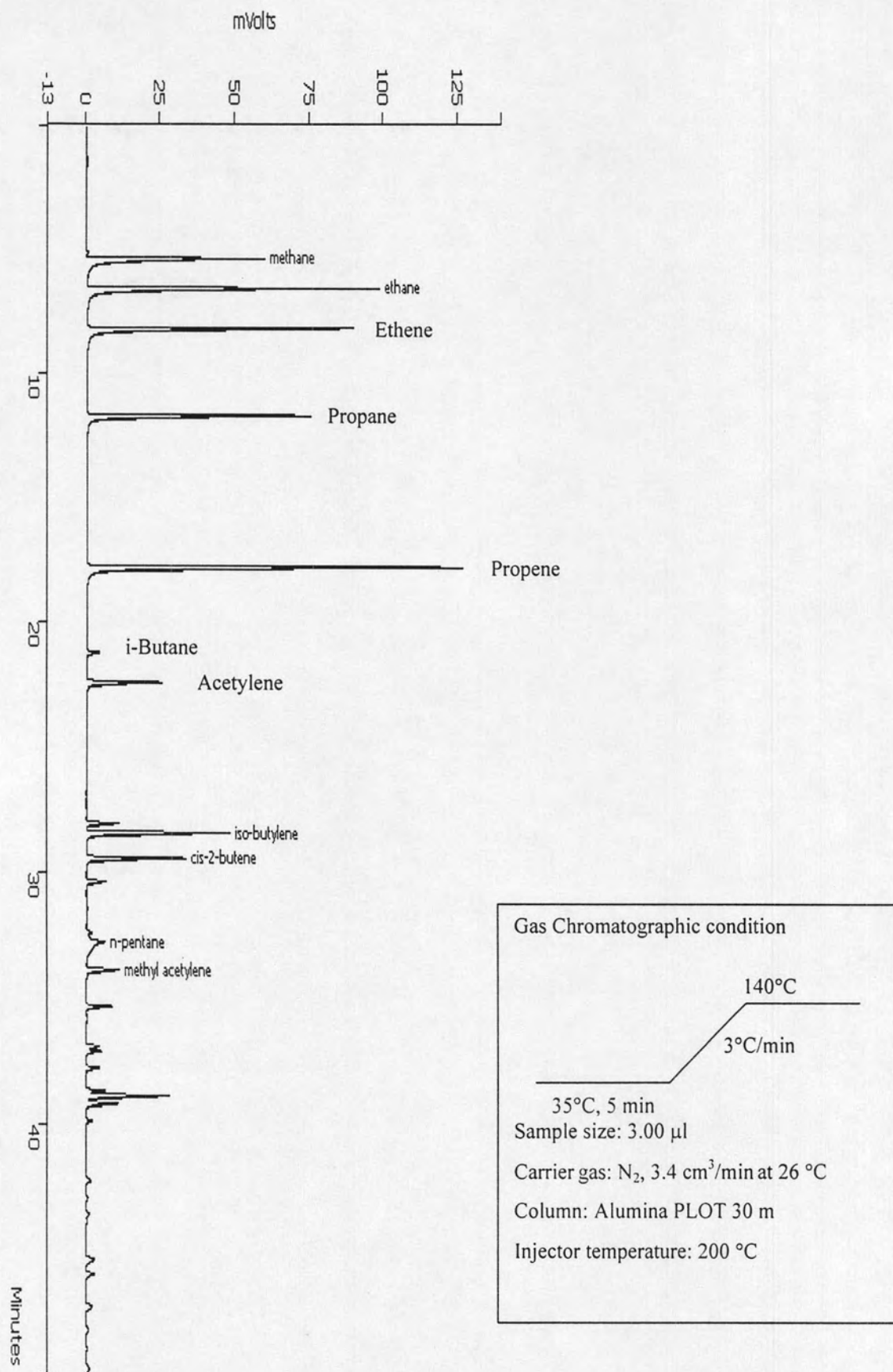
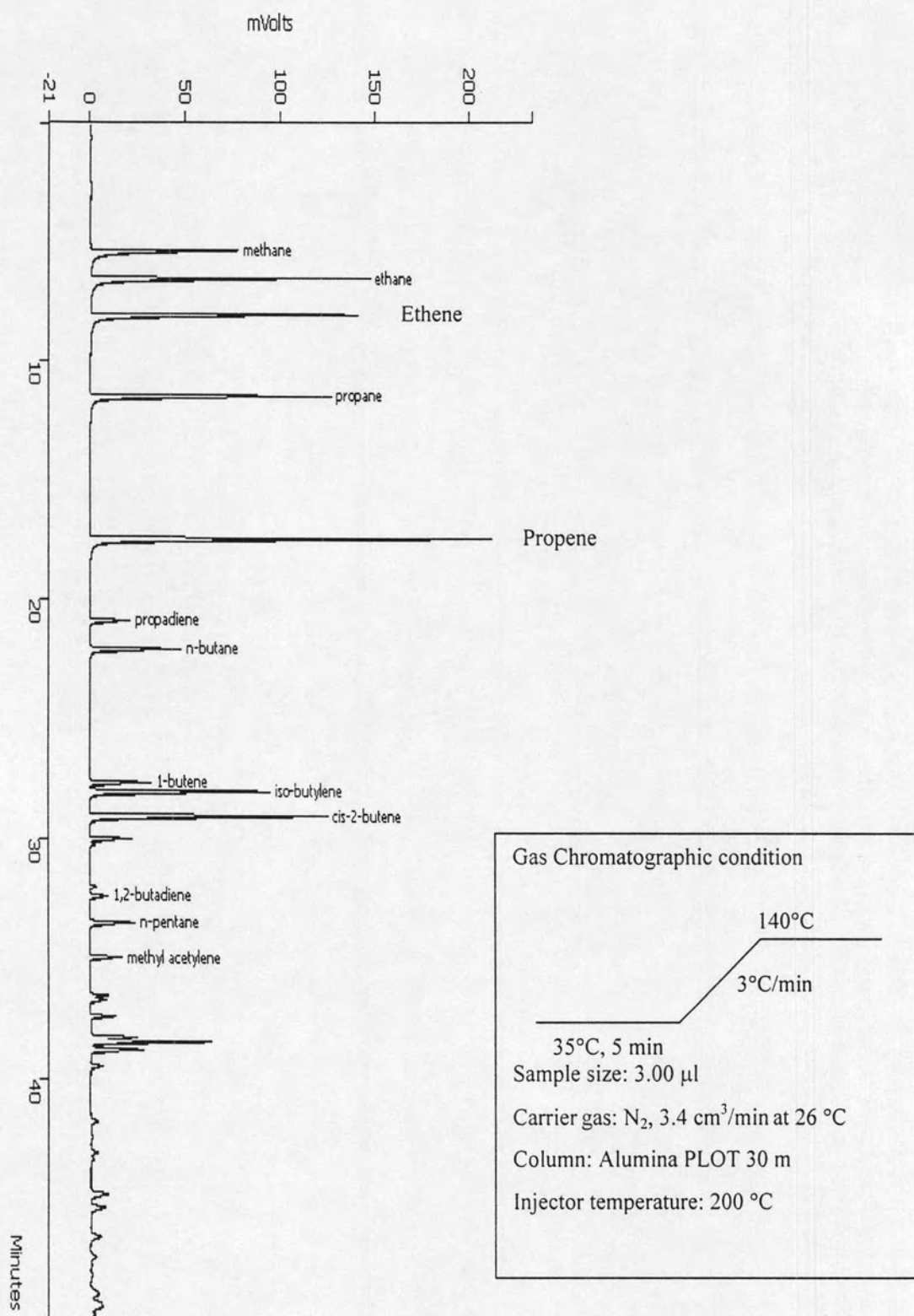


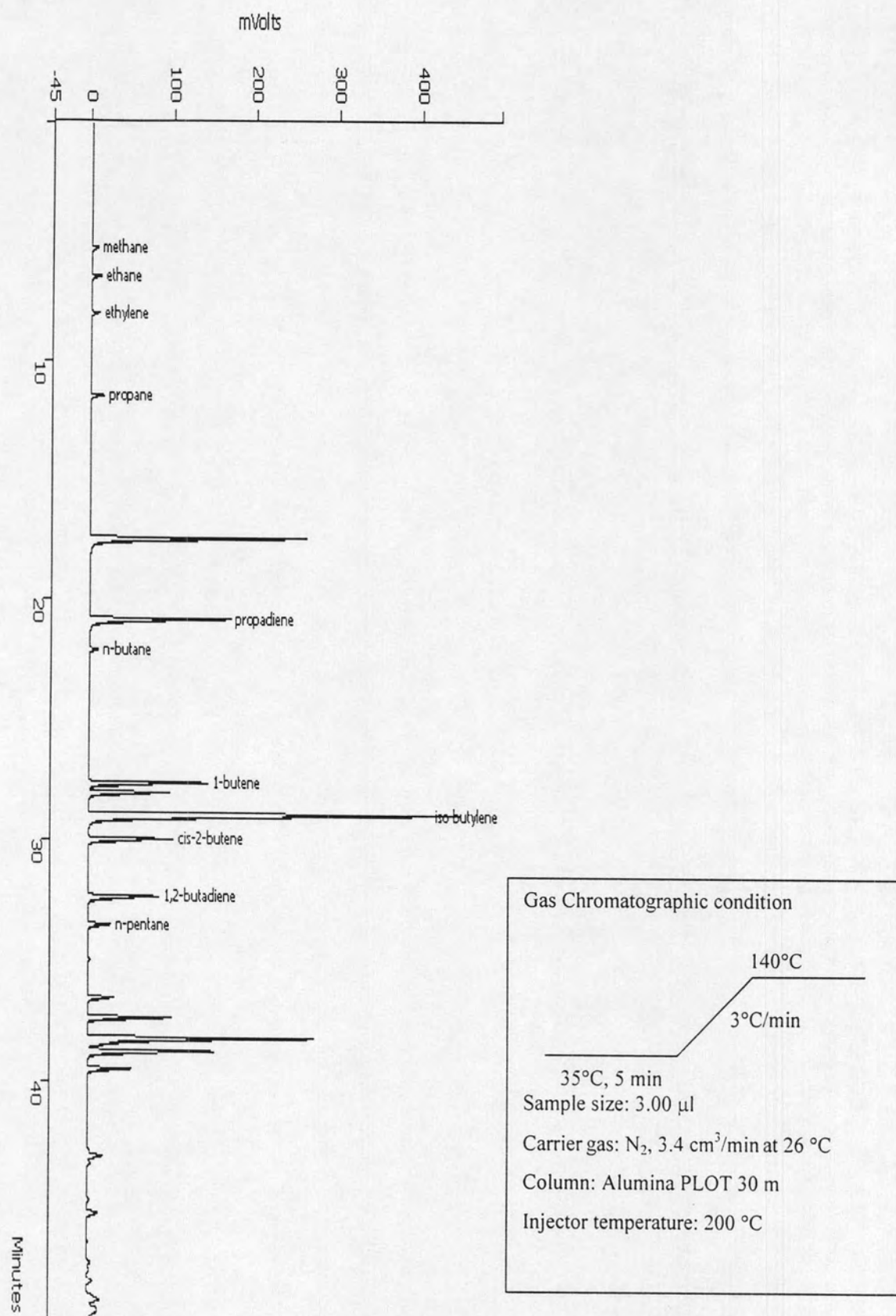
Figure A-1 Gas chromatogram of standard gas mixture.



**Figure A-2** Gas chromatogram of gas product obtained from catalytic cracking of grease over zeolite beta/Al-HMS composite catalysts at 400°C.



**Figure A-3** Gas chromatogram of gas product obtained from catalytic cracking of lubricant oil over zeolite beta/Al-HMS composite catalysts at 380°C.



**Figure A-4** Gas chromatogram of gas product obtained from catalytic cracking of PP over zeolite beta/Al-HMS composite catalysts at 380°C.

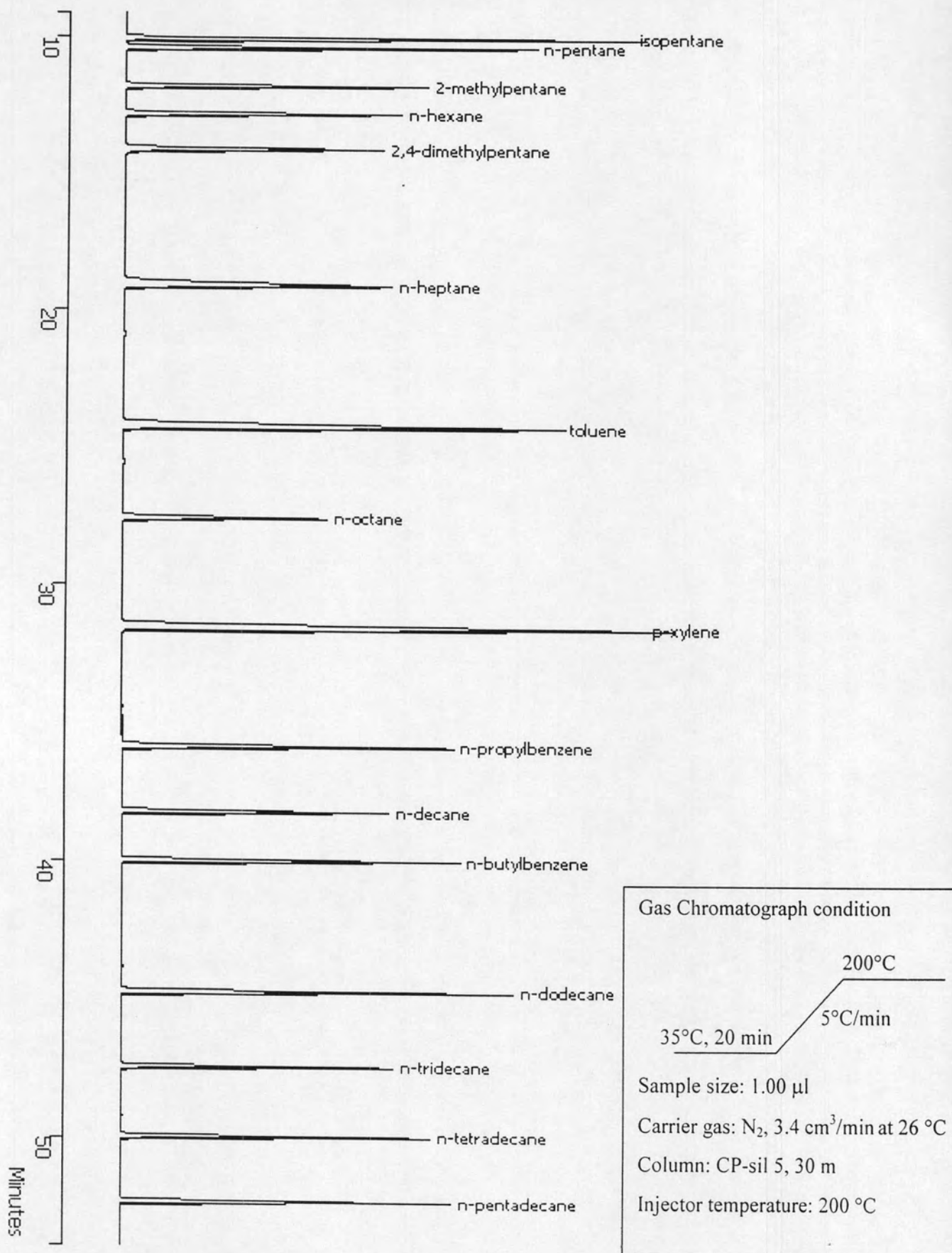


Figure A-5 Liquid chromatogram of standard gasoline (SUPELCO).

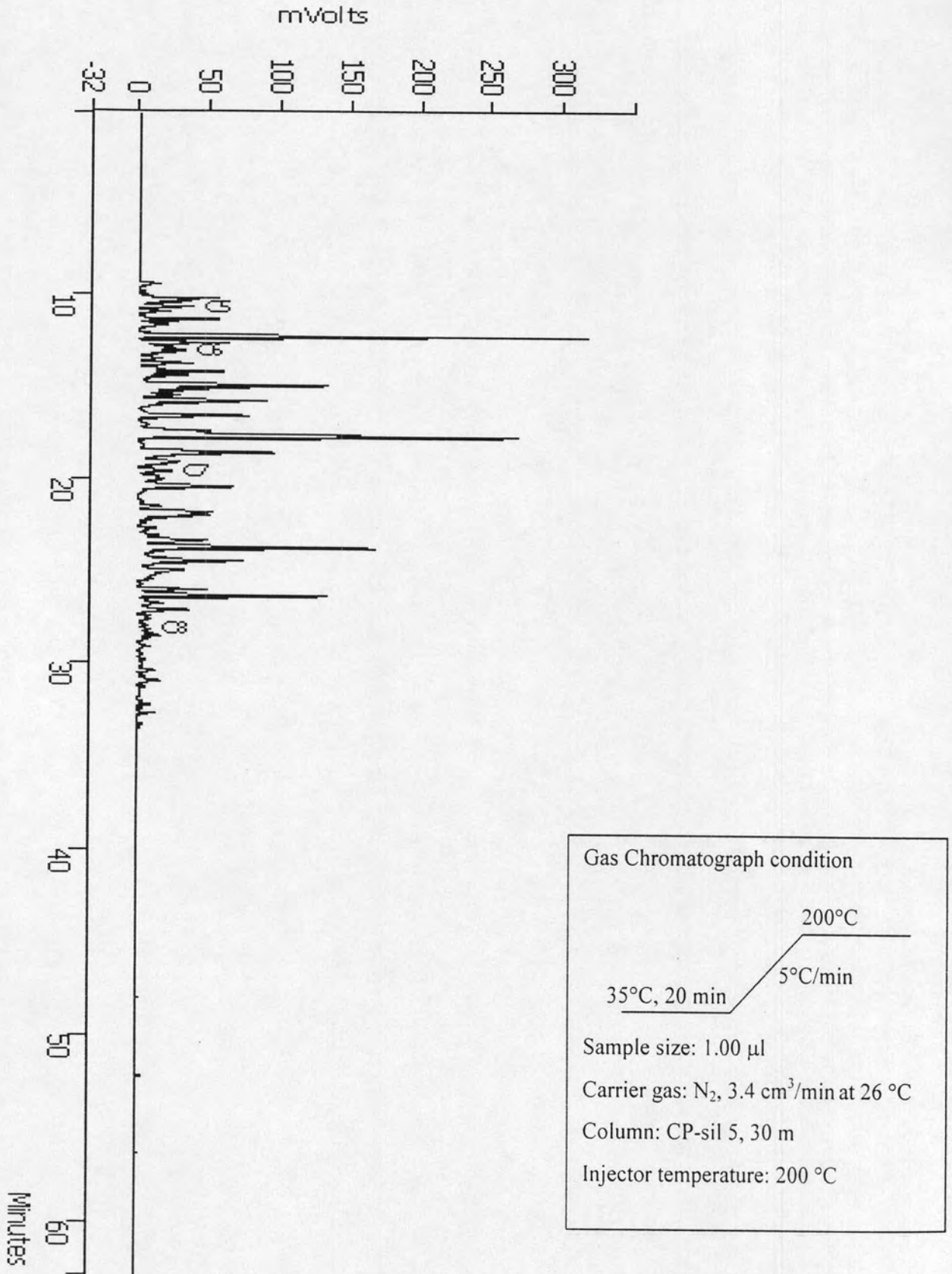
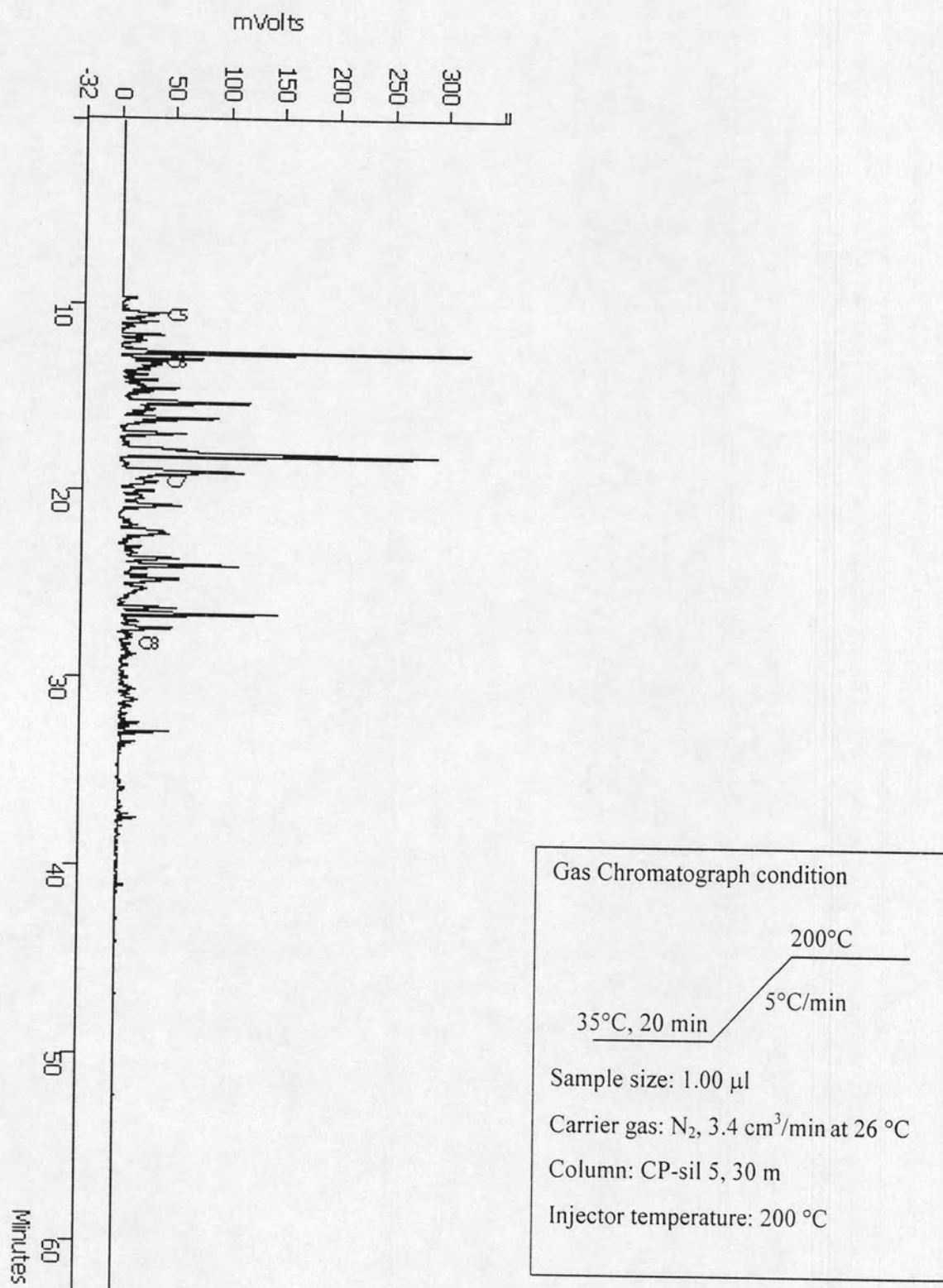


Figure A-6 Liquid chromatogram of liquid product obtained from catalytic cracking of grease zeolite beta/Al-HMS composite catalysts at 400°C.



**Figure A-7** Liquid chromatogram of liquid product obtained from catalytic cracking of lubricant oil zeolite beta/Al-HMS composite catalysts at  $380^{\circ}\text{C}$ .

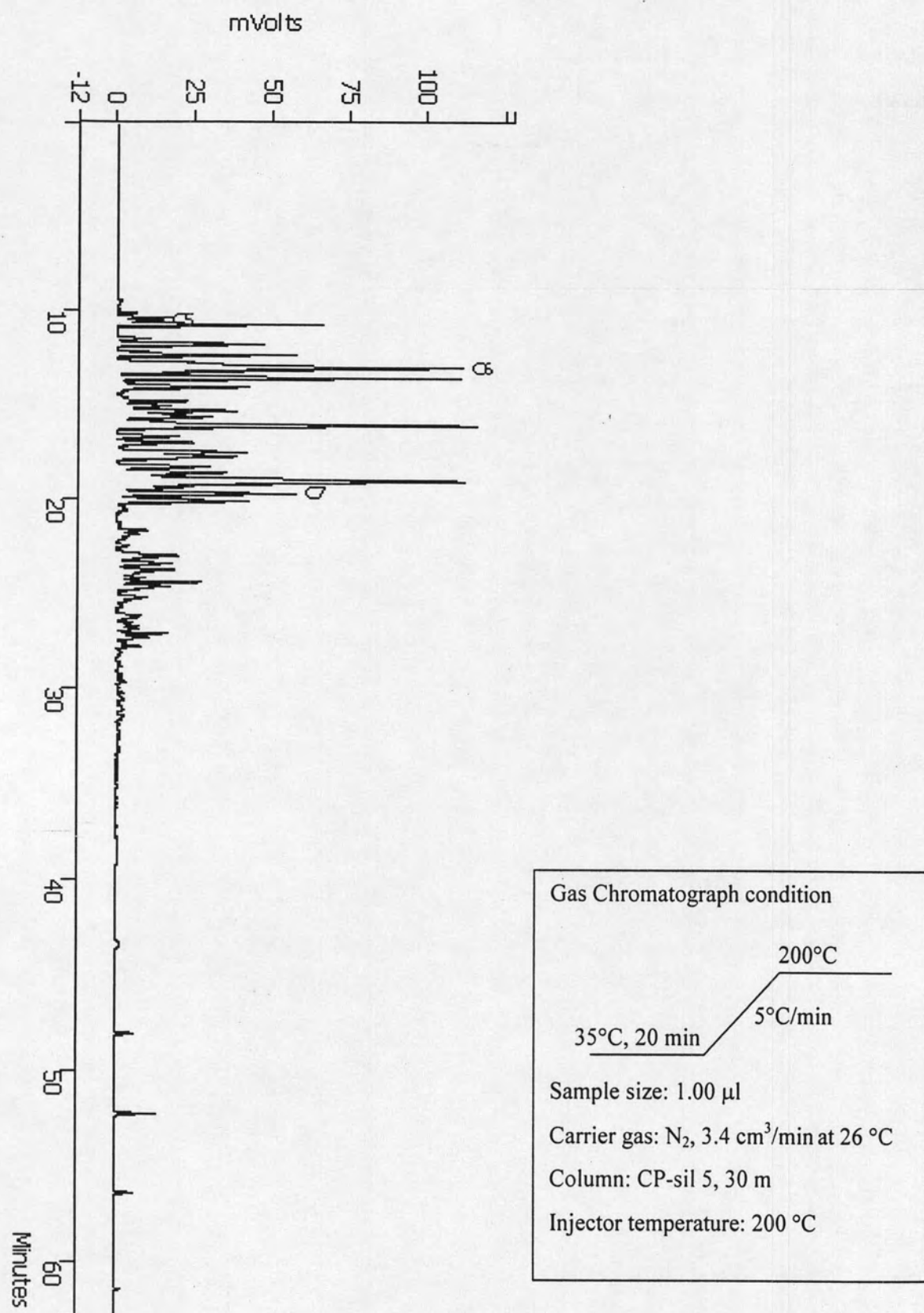


Figure A-8 Liquid chromatogram of liquid product obtained from catalytic cracking of lubricant oil zeolite beta/Al-HMS composite catalysts at 380°C.



## VITAE

Miss Kamonwan Kingputtpong was born on May 16<sup>th</sup>, 1983 in Bangkok, Thailand. She received a Bachelor Degree of Science, major in Industrial Chemistry from King Mongkut's Institute of Technology Ladkrabang in 2005. Since 2005 she has been a graduate student in the program of Petrochemistry and Polymer Science, Faculty of Science, Chulalongkorn University and graduated in 2008.

### PRESENTATIONS

14-16 JAN 2009

**Poster Presentation** "Synthesis and characterization of zeolite beta/Al-HMS composite by direct method" Pure and applied chemistry international conference 2009 (PACCON), Naresuan University, Phitsanulok, Thailand.

12-14 DEC 2007

**Poster Presentation** "Cracking of lubricant oil over Al-HMS catalyst" The 3<sup>rd</sup> Mathematic and Physical Science Graduate Conference (MPSGC), University of Malaya, Kuala Lumpur, Malaysia.

18 – 20 OCT 2007

**Poster Presentation** "Cracking of lubricant oil over Al-HMS catalyst" The 33<sup>th</sup> Congress on Science and technology of Thailand (STT 33), Walailak University, Nakhon Si Thammarat, Thailand.