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Study on the C6 hydrocarbons content in Mongolian crude oil and in import gasoline by GC-FID analytical method

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The World Health Organization classifies benzene as a human carcinogen because of its known effect on increasing risk of cancer as it keeps accumulating in the body. Gasoline is a common product which has benzene. At present, benzene contained in gasoline should be less than 5%, volume as regulated by MNS 0217:2006 standard. In European Union, Russia and China the standard for gasoline the benzene content should not exceed 1% as regulated by EN 228:2012, GOST32513-2013, GB 17930-2013 standard. In Mongolian case, many type of petroleum products and other natural solvents, which contain benzene, are used in daily life. To predefine content of C6 hydrocarbons in product because to prevent the arising benzene from reforming processing, and can calculate and monitor benzene content that may arise from these process. Within the research, to improve “to determine benzene content” standard MNS GOST 29040:2008 which is valid in Mongolia, in addition, to determine benzene content can be safety data sheet for those employees who are working in those condition. The repeatability of the determination of benzene content is lower than 0.014-0.08% with high injection fault. Compared to other researches, the research determined benzene content 0-10% with higher interval and limit of detection of 0.28%. During the determination of hexane and cyclohexane, pole column was more suitable and repeatability was 0.009-0.013. Hexane sensor range was 0.14%, cyclohexane was 0.16%, and determined with limit of 0-10% range using direct method. The total content of petroleum C6 hydrocarbons cannot be determined by above mentioned two columns. The benzene content was 0.08% in gasoline fraction of Zuunbayan crude oil and 0.13-0.14% in gasoline fraction of Tamsagbulag crude oil. Because benzene fraction output is low, benzene content is lower in Zuunbayan field's petroleum. The calculated content of benzene, which is based on C6 hydrocarbons content in Tamsagbulag crude oil, was 0.76%. Therefore, it can be used as base data in petroleum processing in Mongolia. The imported products which are light petroleum have 0.62% and pyrolysis gasoline has 8.9% benzene content. Therefore, a pyrolysis gasoline does not meet Mongolian standard with 8.9% benzene content.

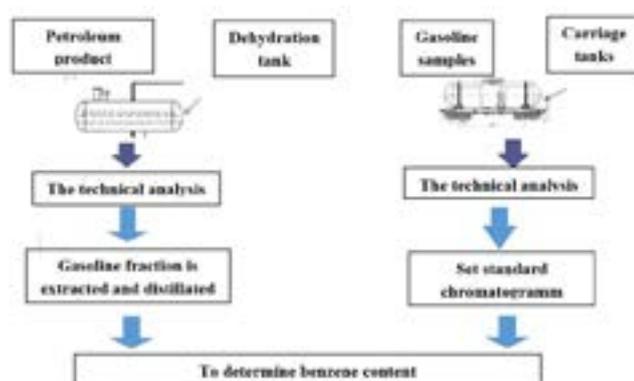


Figure 1: General methodology to determine benzene content.

Biography

Tserendorj Tugsuu has completed her PhD in 2013 from National University of Mongolia (NUM), her dissertation subject was a Chemical study of some products after cracking processes for petroleum derived atmospheric residue. She has published more than 15 papers in scientific journals and has participated in more than 9 research projects as a Project Coordinator and as an Investigator. She has worked at the Petroleum Chemistry Laboratory, Center of Chemistry and Technology of New Materials, NUM as a Researcher from 1997 to 2002, now she has been working in the Department of Chemical and Biological Engineering, School of Engineering and Applied Science, NUM, as an Associate Professor since 2005. She has done her research work at the Ohtsuka Laboratory, Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Japan as a Research Fellow.

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