Biomethane, CNG, hydrogen
LNG/LBG - Gas quality

Gas fuels including biogas fuel is one of the accepted Alternative Fuel Sources in the world today because of its valuable benefits and advantages over petroleum fossil fuels.
Sweden is a world leader in upgrading and use of biomethane for transport. In order to maintain a positive development of this sector, several conditions must be fulfilled at the same time, among them, minimized disturbances for clients. One of the main problems causing disturbances is the quality of the gas. The primary types of contamination are oil carryover from the compressor system, moisture and other impurities as siloxanes, sulfur compounds (for biomethane).

SP Technical Research Institute of Sweden has through research projects developed methods for the sampling and analysis of compounds under discussion for regulations or already regulated by the Swedish standard SS 15 54 38 and European standard. With access to many different instruments of analyses, we can offer gas analyses, all after requirement. Quality assurance of our analyses is obtained by mean of certified gas mixtures in tubes. We also assist if needed for the sampling.

Example of analyses we can offer:

Methane, carbon dioxide, oxygen, nitrogen, (hydrogen and carbon monoxide) according to ISO6974 and calculation of physical properties (density, wobbe-index..) according to ISO6976.
Hydrogen sulphide (detection limit: 1 ppm-vol) (in sampling bags), methyl mercaptan
Water (detection limit: 5 ppm-vol) (in cylinder)
Ammonia (detection limit: 2 ppm-vol) (required specific sampling) (in cylinder)
Siloxanes (individual and total siloxanes reported in µg Si/m^3)
Other VOCs (terpenes, other sulphur compounds excl. H_2S and methyl mercaptan, nitrogen containing compounds excl. NH_3)
Oil carryover (detection limit: 1 ppmM)

Other analyses

LNG/LBG (liquefied natural gas, liquified biogas) is a mixture of low-molecular-weight hydrocarbons with
nitrogen as a principal inert impurity and methane as major component. LBG (Liquefied Bio Gas) is basically the same as liquefied natural gas but is produced from biogas. The introduction of liquefied gas is an important measure in terms of achieving Sweden's objective of a reduced environmental impact from road traffic.

Example of analyses we can offer:
LNG/LBG quality determination (with regard to methane, ethane, propane, butane, isobutane, C5, C6, oxygen, nitrogen, hydrogen, carbon dioxide and carbon monoxide)
Calculation of methane index and LNG/LBG density from the composition

Hydrogen
Used in hydrogen-fueled fuel cell vehicles, the hydrogen quality must be suitable for this technology For this purpose, technical specification were developed and published, ***ISO 14687-2*** *Hydrogen Fuel —Product Specification — Part 2: Proton exchange membrane (PEM) fuel cell applications for road vehicles.* SP Technical Research Institute of Sweden is current through research projects developping methods for the sampling and analysis of compounds included in the standard ISO14687.

Contact Persons
Karine Arrhenius
Phone: +46 10 516 57 28
Haleh Yaghooby
Phone: +46 10 516 57 99

SGC Rapport 243 Impurities in biogas: Validation of methodology of analysis for siloxanes (http://www.sgc.se/ckfinder/userfiles/files/SGC243_eng.pdf)

SGC Rapport 288 Method development for gas quality determination in the LNG storage of a LNG/LCNG refuelling station (Mätmetodsutveckling för gaskvalitetsbestämning i en LNG/LCNG-tankstations LNG-lager) (http://www.sgc.se/ckfinder/userfiles/files/SGC288.pdf)

SGC Rapport 290 Development and validation of methods for test of CNG quality inclusive of oil carryover (Utveckling och validering av testmetoder för test av fordonsgaskvalitet, inklusive oljeförekomst)(http://www.sgc.se/ckfinder/userfiles/files/SGC290.pdf)

Energiforsk rapport 221 (2015), VOC in biogas process waters

Energiforsk rapport 177 (2015), Methods development for hydrogen quality

Energiforsk report 144, Optimal oil concentration range in CNG/biomethane to minimize operational problems

ID: 2670

SP Technical Research Institute of Sweden
Chemistry, Materials and Surfaces
Box 857, SE-501 15 Borås, Sweden
Phone: +46 10 516 50 00
E-mail: info@sp.se, www.sp.se