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A NOTE ON THE CHEMICAL COMPOSITION OF GEOTHERMAL STEAM FROM WELL KR-9 IN KRÝSUVÍK, SOUTHWESTERN ICELAND

Well KR-9, located in the Krýsuvík geothermal area on the Reykjanes peninsula in southwestern Iceland, was drilled in July of 1995 to a depth of 327 m. This is a dry-steam well: it discharges steam only and no liquid phase.

Steam samples for chemical analysis were collected from the well on August 22, 1995. The sample collection and analysis were carried out by the staff of the Chemical Laboratory of Orkustofnun (The National Energy Authority of Iceland).

Table 1 displays the composition of the gas in the steam, in three different units of concentration. No oxygen was detected. This is as expected, since high-temperature geothermal fluids are generally quite reducing, and their oxygen fugacity is extremely low. The non-condensible gas concentration in the steam is about 0.8% by weight.

Table 1. Composition of gas in steam from well KR-9.

Gas component	millimole gas per kg steam	mole per cent of dry gas	milligrams gas per kg steam
Carbon dioxide (CO_2)	131.8	65.25	5800
Hydrogen sulfide (H_2S)	62.24	30.80	2120
Hydrogen (H_2)	7.427	3.68	15
Nitrogen (N_2)	0.496	0.25	14
Methane (CH_4)	0.031	0.02	0.5

The concentrations of non-volatile components present as carry-over in the steam are given in Table 2. The total mineral content of the steam, determined by evaporating an aliquot of steam condensate to dryness at 110°C, was 10 mg/kg.

Table 2. Mineral content of steam from well KR-9. Concentrations in mg/kg.

Sodium (Na)	1.05	Fluoride (F)	0.007	Aluminum (Al)	0.008
Potassium (K)	1.70	Chloride (Cl)	0.88	Manganese (Mn)	0.026
Magnesium (Mg)	0.014	Sulfate (SO_4)	3.27	Iron (Fe)	0.61
Calcium (Ca)	0.19	Boron (B)	0.065	Silica (SiO_2)	0.4

The pH of the steam condensate in contact with the gas at 1 atm was 4.14 at 23.1°C. The conductivity of this condensate was 95 µS/cm at 25°C.

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