carried out in the regime of the total ion current. The resulting mass spectrum was compared with library mass spectrum (library NIST98, WILEY7n, PMW TOXR).

3. Results and discussion

This article presents the results of a study of the chemical composition of distillate fractions with boiling point up to 180, 180-230 and 230-280°C, exudating from coal-tar resin obtained by semi-coking of coal from the Shubarkol deposit. The objects of the study are the initial liquid resin of Sary Arka Spetskoks JSC, Karaganda, Kazakhstan, obtained by the semi-coking of coal from the Shubarkol deposit; and distillate fractions of the resin with boiling point up to 180, 180-230, and 230-280°C. The characteristics of the initial resin are shown in Table 1.

Table 1. Physicochemical index of coke-chemical resin.

Index	Value
Density at 20°C, kg/m^3	1.071
Mass fraction of water %	3.40
Mass fraction of insoluble matters in toluene, %	1.30
Mass fraction of insoluble matters in quinoline, %	0.20
Ash contents, %	0.11
Fraction composition, mass. %:	
Boiling	130
Boiling up to 180°C	2.4
180-330°C	19.0
Up to 330°C + losses	78.6

As shown in Table 1, coal-tar resin boils off over a wide temperature range. As can be seen from Table 1, the yield of fractions with a boiling point up to 180°C in the composition of the resin is 2.4 mass%, the yield of fractions with a boiling point of 180-330°C is 19.0 mass% and above 330°C is 78.6 mass%. The composition of coal-tar resin includes: water 3.4% and the ash elements 0.11%. The elemental compositions of the products were presented in Table 2.

Table 2. Elemental composition of the coke-chemical resin.

Index	Value
Elemental composition, wt.%:	
C	91.11
H	5.50
S	0.35
N	1.46
O (by variety)	1.58

The elemental composition of coal-tar resin is characterized by a higher carbon content of 91.11% and low content of other elements: hydrogen of 5.50%; nitrogen 1.46%, sulfur 0.35%, oxygen 1.58% than it is in petroleum products. Coal (coking) resin, consisting mainly of condensed aromatic hydrocarbons and other high-molecular compounds, indicating to severity processed raw materials. The number of hydrocarbons of the coke-chemical resin is given in the Table 3.

As it shown in table 3, 82 substances in the coke-chemical resin composition were detected by gas chromatography-mass spectrometry: cresols 7.69% and pyrocatechin 6.41%, phenols 2.373%, ethyl phenols 2.673%, methylnaphthalenes 2.091%, saturated hydrocarbons 1.426%, naphthol 0.573%. The composition of the coal-tar resin contains alkyl substituted homolog of benzene 6.92%, naphthalene 2.091%, diphenyl, indene 0.467%, anthracene, fluorene, phenanthrene, fluoranthene 0.8%, pyrene, chrysene, perylene, benzpyrene, picene, coronene, and their holonuclear counterparts. In addition to hydrocarbons, the resin contains nitrogen-containing compounds with spirrellic and pyridine rings,