

LIST OF TABLES

<i>Table</i>	<i>Page</i>
1. Geological Data of the Productive Zones in the Wells of the Oil-Field Waters	75
2. General Physico-Chemical Properties of the Oil-Field Water	76
3. Alkali and Alkaline Earth Cations in the Oil-Field Waters Using Different Analytical Techniques	79
4. Alkali and Alkaline Earth Cations in the Oil-Field Waters Determined by the ICP-AES with Standard Additions	86
5. Boron, Iron and Manganese in the Oil-Field Waters Using Different Determination Techniques	87
6. Anions in the Oil-Field Waters Using Different Determination Techniques	92
7. Determined Cations and Anions (mg/L) in the Oil-Field Waters	97
8. Reaction Values (me/L) of Cations and Anions in the Oil-Field Waters	108
9. Reaction Values (epm) of Cations and Anions in the Oil-Field Waters	109
10. Probable Compounds of the Ions in the Oil-Field Waters	112
11. Reaction Groups and Properties (e %) of the Ions in the Oil-Field Waters	114
12. Genetic Coefficients of the Major Ions in the Oil-Field Waters	115
13. Application of the Palmer, Sulin, and Chebotarev Water Classification Systems to the Oil-Field Waters	117
14. Composition Changes of Ions during their Geologic Ages Referred to the Present Sea Water	122
15. Linear Regression Parameters of Correlations among Density (X) and Properties (Y) of the Oil-Field Waters	124
16. Linear Regression Parameters of Correlations among Depth (X) and Properties (Y) of the Oil-Field Waters	126
17. Linear Regression Equations of Intercorrelations of Physico-Chemical Properties of the Oil-Field Waters	127
18. Correlation Coefficients of Intercorrelations of Physico-Chemical Properties of the Oil-Field Waters	128
19. Fatty Acids and Oils Extracted from the Oil-Field Waters and Oil Components Fractionated by Column Chromatography	130
20. Gas Chromatographic Analysis of the Methyl Esters of the Fatty Acids Extracted from the Oil-Field Waters	132

<i>21. Gas Chromatographic Analysis of the Saturates Separated from the Extracted Oil</i>	137
<i>22. High Performance Liquid Chromatographic Analysis of the Aromatics Separated from the Extracted Oils</i>	138
<i>23. Wavenumbers and Absorbances of the Main Bands in the Infrared Spectra of the Oil Extracted from the Oil-Field Waters</i>	145
<i>24. Assignment of Vibrations of the Functional Groups in the Infrared Spectra of the Oils Extracted from the Oil-Field Waters</i>	146

LIST OF FIGURES

<i>Figures</i>	Page
1. Location map of the oil-fields producing the studied water samples.	58
2. Calibration curve of the standard boron solutions according to APHA 4500-B, C: Carmine Method.	63
3. Calibration curve of the standard iron solutions according to ASTM D1608 and APHA 3500-Fe: <i>o</i> -Phenanthroline Method.	63
4. Calibration curve of the standard bromide solutions according to ASTM D3869 Method: Test Method D-Colorimetric.	66
5. Calibration curve of the standard iodide solutions according to ASTM D3869 Method: Test Method B-Colorimetric.	68
6. Calibration curve of the standard nitrate-nitrogen solutions according to APHA 4500-NO ₃ ⁻ , B: Ultraviolet Method.	68
7. Ion chromatograms of the cations in the oil-field waters.	80
8. Correlation between the ICP and IC methods for determination of sodium in the oil-field waters.	82
9. Correlation between the ICP and IC methods for determination of potassium in the oil-field waters.	82
10. Correlation between the ICP and IC methods for determination of magnesium in the oil-field waters.	83
11. Correlation between the ICP and EDTA methods for determination of magnesium in the oil-field waters.	83
12. Correlation between the ICP and IC methods for determination of calcium in the oil-field waters.	84
13. Correlation between the ICP and EDTA methods for determination of calcium in the oil-field waters.	84
14. Correlation between the ICP-standard additions and ICP methods for determination of sodium in the oil-field waters.	88
15. Correlation between the ICP-standard additions and ICP methods for determination of potassium in the oil-field waters.	88
16. Correlation between the ICP-standard additions and ICP methods for determination of magnesium in the oil-field waters.	89

17. Correlation between the ICP-standard additions and ICP methods for determination of calcium in the oil-field waters.	89
18. Correlation between the carminic and mannitol methods for determination of boron in the oil-field waters.	90
19. Correlation between the ICP and <i>o</i> -phenanthroline methods for determination of iron in the oil-field waters	90
20. Ion chromatograms of the anions in the oil-field waters.	93
21. Correlation between the IC and argentometric methods for determination of chloride in the oil-field waters.	95
22. Correlation between the IC and colourimetric methods for determination of bromide in the oil-field waters	95
23. Graphical representation of the average ion concentrations (mg/L) in the oil-field waters by Schoeller diagram.	98
24. Graphical representation of the ion reaction values (me/L) in the oil-field waters by Schoeller diagram.	99
25. Graphical representation of the ion reaction values (RV) by Tickell (a), modified Tickell (b), and Stiff (c) diagrams.	100
26. Graphical representation of the ion reaction values (epm) in the oil-field waters by Schoeller diagram.	110
27. Gas chromatograms of methyl esters of fatty acids in the oil-field waters.	133
28. Concentration-carbon number of methyl esters of fatty acids in the oil-field waters.	135
29. Gas chromatograms of the saturates separated from the extracted oils of the oil-field waters	139
30. Concentration-carbon number of <i>n</i> -paraffins in the saturates separated from the extracted oils of the oil-field waters	141
31. High performance liquid chromatography of the polyaromatics in the aromatics of the oil-field waters.	142
32. Infrared spectra (wavenumber- % transmittance) of the oils extracted from oil-field waters.	174
33. Infrared spectra (wavenumber-absorbance) of the oils extracted from oil-field waters	149