

DIELECTRIC PROPERTIES OF ROCKS  
AT ULTRA HIGH FREQUENCIES

TABLE OF CONTENTS

	<u>Page Number</u>
SUMMARY .....	1
LIST OF FIGURES .....	3
LIST OF TABLES .....	6
SECTION 1 INTRODUCTION .....	7
SECTION 2 MIXTURE FORMULAS .....	10
SECTION 3 DIELECTRIC PROPERTIES OF WATER .....	17
SECTION 4 DIELECTRIC PROPERTIES OF OIL AND GAS .....	18
SECTION 5 DIELECTRIC PROPERTIES OF DRY ROCKS .....	19
SECTION 6 MEASUREMENT TECHNIQUES .....	21
SECTION 7 THE COAXIAL-LINE METHOD .....	25
SECTION 8 THE NETWORK ANALYZER .....	30
SECTION 9 MEASURED DIELECTRIC CONSTANTS OF WATER-SATURATED CONSOLIDATED ROCKS AT 800 TO 1200 MHz .....	34
SECTION 10 DISCUSSION ON THE TPO FORMULA .....	37
SECTION 11 DISCUSSION ON THE CRIM FORMULA .....	38
SECTION 12 DISCUSSION ON THE HANAI-BRUGGEMAN-SEN FORMULA .....	40
SECTION 13 PRESENTATION OF MEASURED CORE DATA IN $T_{p1}-A_c$ FORMAT .....	43
SECTION 14 EFFECTS OF KCl SOLUTION IN A ROCK .....	45
SECTION 15 CONCLUSIONS AND RECOMMENDATIONS .....	48

	<u>Page Number</u>
ACKNOWLEDGEMENTS .....	52
REFERENCES .....	53
APPENDIX A   PROCEDURE FOR COAXIAL-LINE SAMPLE PREPARATION .....	350
APPENDIX B   DERIVATION OF THE COMPENSATION .....	352
PARAMETERS FOR THE NETWORK ANALYZER	
APPENDIX C   DIELECTRIC CONSTANTS OF FUSED SILICA AND .....	371
GLASS (DATA OBTAINED BY THE NATIONAL BUREAU OF STANDARDS)	
APPENDIX D   MINERALOGY OF ROCKS STUDIED IN THIS .....	374
REPORT	