

TABLE OF CONTENTS

Only the manuscripts that have completed the peer review process is listed in this table of contents.

INTRODUCTION

CRUDE HEAT EXCHANGER FOULING - FIELD OBSERVATIONS	1
GENERATION OF EXPERIMENTAL DATA FOR MODEL TRAINING TO OPTIMIZE FOULING PREDICTION	6

FOULING IN HYDROCARBON SYSTEMS

ECONOMIC AND ENVIRONMENTAL IMPLICATIONS OF FOULING IN CRUDE PREHEAT TRAINS	17
IMPACT OF FOULING ON THERMO-HYDRAULICS OF VISCOUS COOLERS	26
DETERMINING THE FOULING TENDENCY OF DIFFERENT FEEDSTOCKS IN THE FOULING ASSESSMENT SETUP (FAST)	35
COMPARISON OF HEAT EXCHANGER FOULING TEST RESULTS FOR ONCE-THROUGH AND RECIRCULATING MODES OF OPERATION AT CONSTANT FLOWRATE	43
CHARACTERIZING FOULING TENDENCY OF CRUDE OIL ON A SURFACE USING A HIGH TEMPERATURE VARIABLE SHEAR COUPON TEST RIG	47
INCORPORATION OF FOULING DEPOSIT MEASUREMENTS IN CRUDE OIL FOULING TESTING AND DATA ANALYSIS	54
ENHANCEMENT OF REFINERY PROFITABILITY VIA INCREASING THE LIFE-CYCLE OF WELDED PLATE HEAT EXCHANGER IN THE SOUR WATER STRIPPING PROCESS	66

FOULING IN FOOD PROCESSING

DIFFUSIVE MASS TRANSFER IN CLEANING OF A JELLYLIKE WHEY PROTEIN FOULING LAYER	69
ULTRASONIC CODA WAVE INTERFEROMETRY (CWI) FOR DETECTING A CHANGE AT INTERFACE OF A SOLID SURFACE - APPLICATIONS FOR MONITORING FOULING, BIOFILM GROWTH, CLEANING AND CORROSION	81
INFLUENCE OF RHEOLOGICAL PROPERTIES AND PULL-OFF FORCES OF NATIVE AND MODIFIED STARCHES ON CLEANING IN PLANE CHANNEL FLOW	88
ROLE OF CASEIN MICELLE ON THE WHEY PROTEIN FOULING IN A BENCH-SCALE FOULING DEVICE	98
SYSTEM FOR AUTOMATED MONITORING OF LOCAL SOIL REMOVAL DURING CLEANING IN CLOSED FOOD PROCESSING LINES WITH A QUARTZ CRYSTAL SENSOR	103

BIOFOULING

FLOWING FOAM: AN ECO-EFFICIENT STRATEGY FOR CLEANING OF CONTAMINATED INDUSTRIAL EQUIPMENT	112
---	-----

FOULING MITIGATION

SOFTWARE-GUIDED CLAMP-ON POWER ULTRASOUND SOLUTION FOR FOULING MITIGATION IN TUBULAR HEAT EXCHANGERS	116
INTERACTION OF HEAT TRANSFER ENHANCEMENT AND FOULING IN OPERATING HEAT EXCHANGERS	124
USING CONTINUOUS HELICAL FLOW ELECTRIC HEAT EXCHANGERS TO REDUCE FOULING	134

CFD MODELLING

CFD-BASED MODELING OF A COHESIVELY SEPARATING SOIL LAYER IN CONSIDERATION OF LOCAL SOIL DISTRIBUTION	139
OPTIMIZATION OF MACRO-STRUCTURED PIPE SURFACES TO IMPROVE THE CLEANING PERFORMANCE	149
NUMERICAL INVESTIGATION OF TUBESIDE MALDISTRIBUTION IN SHELL-AND-TUBE HEAT EXCHANGERS	158
CFD MODELLING OF AN INITIAL POWDERY LAYER ON COOLED TUBULAR SURFACES	166

CRYSTALLIZATION FOULING

THE POTENTIAL OF THERMALLY CONDUCTIVE POLYMER COMPOSITES REGARDING CRYSTALLIZATION FOULING MITIGATION	174
CRYSTALLISATION FOULING FROM AQUEOUS SOLUTIONS OF CLATHRATE HYDRATES	184
INVESTIGATIONS OF CRYSTALLIZATION FOULING IN COLUMNS	192
IMPACT OF A SURFACTANT ON FILM FLOW AND CRYSTALLIZATION FOULING IN FALLING FILM EVAPORATORS	199
ROLE OF ZINC IN BULK PRECIPITATION FROM STEAMING PROCESS OF POTABLE WATER	209

HEAT EXCHANGER NETWORKS AND DIGITAL TWIN TECHNOLOGIES

HEATTRAX: A NEW APPROACH TO EXCHANGER FOULING MANAGEMENT	218
FOULING THICKNESS MODELING FOR REFINERY CLEANING SCHEDULE OPTIMIZATION	224
FOULING MANAGEMENT THROUGH DIGITAL TRANSFORMATION	231
FOULING MANAGEMENT AT TOTALENERGIES THROUGH USE OF HTRI SMARTPM™: CASE STUDY OF A PROJECT PROPOSAL FOR CLEANING SCHEDULE OPTIMIZATION	240

INDUSTRIAL CLEANING

THERMAL CLEANING OF HEAT EXCHANGERS NO ALTERNATIVE BUT A BETTER WAY TO CLEAN	249
DEVELOPMENTS IN PERSONAL SAFETY FOR INDUSTRIAL CLEANING	256
SIMULTANEOUS EFFECTIVE REMOVAL OF POLYSULFIDE AND POLYOLEFIN FOULING FROM TWISTED TUBE HEAT EXCANGERS IN HYDROCRACKER PROCESS USING ULTRASONIC CHEMICAL CLEANING	264
CHEMICAL CLEANING OF CRUDE OIL FOULING DEPOSITS; APPLYING THE COKE SPECTRUM	270

SURFACE MODIFICATIONS

ANTI-FOULING COATING TECHNOLOGIES : A CRITICAL REVIEW AND DEVELOPMENT ROADMAP	280
OVERVIEW OF BUTADIENE CHEMICAL REACTION FOULING IN STEAM CRACKER AND ITS CONTROL BY CARBON STEEL SURFACE MODIFICATION	289
INVESTIGATION OF ICEPHOBIC COATINGS FOR SUPERCOOLING HEAT EXCHANGERS UNDER SUBMERGED CONDITIONS USING ICE DETECTION EQUIPMENT	296
NOVEL SURFACE TREATMENT TO MITIGATE FOULING IN HEAT EXCHANGERS AND PROCESS EQUIPMENT	201
COATINGS TO REDUCE FOULING IN PLATE HEAT EXCHANGERS: TWO CASE STUDIES	310
PIGMENTED ANTIFOULING COATINGS FOR IMPROVED ON-SITE INSPECTION	319