LIST OF FIGURES

LIST OF TABLES

LIST OF SYMBOLS AND ABBREVIATIONS

α	Significance level
B	Stern–Geary constant
b_a, b_c	anodic, cathodic Tafel constants
β	shape parameter
CE	Counter Electrode
C_i	initial hydrogen concentration
C_L	lattice hydrogen concentration
CNC	Computer Numerical Control
C_o	surface hydrogen concentration
C_σ	hydrogen concentration under tensile stress σ
C_T	hydrogen concentration in trapping sites
γ	location parameter
D	diffusion coefficient
DeE	De–Embrittlement
ΔG	Gibbs free energy change
D_{latt}	trap free lattice diffusion coefficient
δ	scale parameter
E	electrode potential
E^o	standard electrode potential
Eb	potential well of a trapping site
Ecorr	corrosion potential
EDAX	Energy Dispersive X–Ray Analysis
EI	Embrittlement Index
En	energy level for absorption from the surface to the bulk
Es	energy level for absorption from the bulk to a trapping site
Et	trap activation energy
F	Faraday constant
FIB	Focused Ion Beam
f(t)	probability density function
HAC	Hydrogen Assisted Cracking
HE	Hydrogen Embrittlement
HELP	Hydrogen Enhanced Local Plasticity

HER	Hydrogen Evolution Reaction
η	hydrogen overpotential
θ_T	fraction of occupied trapping sites
i_c	charging current density
Icorr	corrosion current density
i_r	steady state desorption flux or hydrogen recombination current density
IVD	Ion Vapour Deposition
i_∞	steady state hydrogen permeation flux
j	permeation flux
J_0	entrance current density
J(t)	efflux or permeation current density
J_∞	steady state flux
K	stress intensity factor
k	trapping parameter
k''	equilibrium absorption–adsorption constant
K_{th}	threshold stress intensity factor
L	membrane thickness
LME	Liquid Metal Embrittlement
LPR	Linear Polarisation Resistance
M	atomic mass
μ	mean value of the population
N	number of trap sites per unit volume of material
n	number of electrons participating in a reaction
ν	degree of freedom
ORR	Oxygen Reduction Reaction
p	release rate parameter
P_f	probability of failure
P_s	probability of survival
PVD	Physical Vapour Deposition
Q_t	hydrogen quantity diffusing through a membrane within time t
Q_{Tf}	quantity of permeated hydrogen within time to failure
R	gas constant
RA	Reduction in Area

ReE	Re–Embrittlement
RE	Reference Electrode
Rp	polarisation resistance
ρ	density
s	standard deviation of a group
s^2	variance of a group
SCC	Stress Corrosion Cracking
SCE	Saturated Calomel Electrode
SD	Standard Deviation
SEM	Scanning Electron Microscope
s_p	pooled standard deviation of two groups combined
SSRT	Slow Strain Rate Test
σ	standard deviation of the population
σ^2	variance of the population
T	temperature
t	test statistic
t_b	breakthrough time
TEM	Transmission Electron Microscopy
t_f	time to failure for every test specimen individually
t_i	minimum crack incubation time
t_L	time lag
t_o	mean value of the times to failure of all uncoated control specimens
UMS	Unbalanced Magnetron Sputtering
UTS	Ultimate Tensile Strength
V	molar volume
WE	Working Electrode
x	Weibull slope
Y	yield stress
z	number of electrons in oxidation reaction
ZRA	Zero Resistance Ammeter