

Index

a

acoustic phonons 23
activated adsorption 33
activation energy 33, 44
adiabatic approximation 7
adsorbate 27
adsorbate symmetries 152
adsorbent 27
adsorption 27
adsorption energy 30
adsorption isotherm 44
adsorption potential 30
adsorption rate 43
adsorption sites 30
AFM 222
Airy-disc 202
allowed energy bands 15
anharmonicity 101
anisotropic transition layer 66
anti-Stokes scattering 124
apertureless SNOM 226
associative desorption 33
attenuated total reflection 81
Autler–Townes splitting 193

b

BAM 213
bolometer 93
Bravais lattice 7
Brewster angle 62
Brillouin zone 13, 15
bulk susceptibility 143
buried interface 155
buried interfaces 159

c

CARS 161
characteristic function 26
chemisorption 27
chirality 153
coherence factor k_1 203
coincidence lattice 9

collisional broadening 52
compact layer 45
confocal microscopy 209
correlation function 26
correlation length 26
cosine law 50
critical angle 63
crossing angle 162
cyclic voltammetry 48
cyclic voltammogram 48

d

dangling bonds 7, 18
dark-field condensor 204
decaying image 41
dephasing 40
dephasing time 40, 52
depolarization 88
desorption 44
desorption rate 44
detailed balance 50
DFWM 161
differential method 103
diffuse layer 45
dipole-active transitions 98
direct gap 17
direct scattering 51
dispersion relation 74
dissociative adsorption 33
Drude model 21
dynamic charge transfer 41
dynamic polarizability 29, 38

e

electrode–electrolyte interface 46
electromodulation of reflection phase 135
electron spill-out 144
electron–hole pairs 40
electronic surface states 12, 16, 18
electroreflectance 135
electrostatic adsorption 45
ellipsometer 112

ellipsometric angles 62
 ellipsometry 62
 energy transfer 107
 ESEM 226
 evanescent wave 64, 164
 evanescent wave condensor 204
 evanescent wave spectroscopy 173
 extrinsic surface states 19

f

Fermi wavevector 144
 fluorescence 120
 forbidden energy gaps 15
 four-wave mixing 160
 fourth-harmonic generation 167
 frequency shift 37
 Fresnel formulae 61
 FRET 229
 Friedel oscillations 144
 FTIR ellipsometer 95
 FTIR spectrometer 94

g

gas boundary layer 48
 gas-surface scattering kernel 51, 52
 Globar 93
 growth monitoring 117

h

height distribution function 26
 holographic grating 162
 HOMO 31
 hyperpolarizability 156

i

image dipole 28
 image states 18
 incoherent lattice 10
 incommensurate structure 10
 infrared detectors 93
 infrared reflection-absorption spectroscopy 97
 infrared sources 93
 infrared spectral range 93
 infrared spectroscopic ellipsometry 94
 inhomogeneous broadening 97
 inner Helmholtz plane 45
 intensity enhancement 81
 interband transitions 157
 interface 5
 interferogram 94
 intrinsic surface states 19, 115
 inversion symmetry 143
 inverted gap 17

j

jellium model 70

k

Knudsen layer 5, 52
 Kretschmann configuration 79

l

Langmuir isotherm 45
 Langmuir model of adsorption 43
 Langmuir-Blodgett film 96
 Langmuir-Blodgett technique 121
 law of reflection 59
 law of refraction 59
 lifetime 39, 40, 52
 linear susceptibility 124, 178
 linear-sweep voltammetry 47
 linewidth 40, 52
 local field enhancement 149, 164
 local field factor 148
 local field strength tensor 146
 localized surface polaritons 82
 Lorentz force 154
 LSM 207
 LUMO 31

m

macroscopic layer 64
 Maxwellian velocity distribution function 49
 mechanical renormalization 37
 Michelson interferometer 94
 microscopic layer 67
 Miller indices 10
 Mirau interferometer 214
 modulated ellipsometry 135
 molecular hyperpolarizability 156
 MSHG 154
 multiphonon process 40
 multiphoton microscopy 207

n

NanoWizard 224
 near-point 201
 nearly-free electron approximation 13
 nonlinear polarizability 145
 nonlinear surface susceptibilities 147
 nonlocal optical response 70, 177
 nonradiative mode 75
 nonretarded limit 19
 numerical aperture 203

o

optical phonons 23, 25
 optical resolution 204
 Otto configuration 78
 outer Helmholtz plane 45

p

p-polarization 60
 penetration depth 63, 75

- phase changes on reflection 62
- phase conjugation 162
- phase matching, DFWM 161
- phase matching, surface CARS 165
- photoelastic modulator 117
- photoluminescence 120, 122
- photoluminescence spectroscopy 122
- photometric ellipsometer 112
- photonic band gap 221
- physisorption 27, 28
- piezoelectric contraction 150
- plasma electroreflectance 136
- plasma frequency 21
- PMIM 214
- polaritons 73
- polarization memory length 53
- population memory length 53
- potential of zero charge 46
- power spectrum 27
- Poynting vector 60
- primitive vectors 8
- propagation length 75, 102
- pseudo-selection rules 98
- PSTM 224
- pump-probe scheme 105, 186

- q**
- quantum well oscillations 156

- r**
- Raman scattering 123
- rate of electron collisions 102
- Rayleigh–Abbe-criterion 202
- reciprocal lattice 11
- reconstruction 6
- reference surface 26
- reflection anisotropy spectroscopy 116
- reflection coefficient 60
- reflectivity 60
- relaxation of surface 6
- resolving power 203
- resonance Raman scattering 125
- root-mean-square height 26

- s**
- s-polarization 59
- scattering of light 87
- Schönflies notation 151
- selection rules 97, 125
- selective reflection 173
- selective reflection spectroscopy 173
- SFG 158
- SH adsorbate orientation 152
- SH coverage dependence 145
- SH microscopy 147, 217
- SH resonance enhancement 156
- SH signal intensity 145
- SH spectroscopy 156
- SH surface symmetry 150
- SH symmetries 150
- SH, anisotropic 150
- SH, magnetic field induced 154
- SH-SFOM 234
- SH-SNOM 234
- Shockley states 17, 18
- silicon reconstruction 151
- simple superlattice 9
- single molecule microscopy 228
- skin effect 63
- skin layer 63
- SMOKE 153
- SNOM 224
- spatial dispersion 144
- specific adsorption 45
- spectral narrowing 173, 179
- spectroscopic ellipsometry 112
- spin dynamics 156
- SPNM 230
- sticking probability 43
- STM 222
- Stokes scattering 124
- superlattice 8
- surface CARS 165
- surface charge 72
- surface circular dichroism 155
- surface coverage 43
- surface differential reflectivity 114
- surface electromagnetic waves 102
- surface electromagnetic waves, absorption coefficient 103
- surface magnetization 153
- surface morphology 5
- surface phonons 22, 24
- surface photoabsorption 115
- surface plasmons 19, 148
- surface polaritons 73
- surface polaritons, excitation on grating 79
- surface polaritons, excitation on rough surface 80, 90
- surface region 5
- surface resonances 19
- surface roughness 25
- surface states 157
- surface structure 5
- surface structure notation 10
- surface susceptibility 143
- surface-enhanced Raman scattering 126
- switch potential 48
- symmetry classes 151
- symmetry of adsorption sites 33

- t**
- Tamm states 17, 18

TE wave 73
THG 161
three-phase system 64
TIRM 211
TM wave 73
transient grating scattering 162
transient spectra 106, 107
translational invariance 6
transmission spectroscopy 117
transmissivity 60
tubular length 202
two-photon confocal microscopy 210
two-photon fluorescence spectroscopy
190

two-prism method 102

v

van der Waals interaction 28
van der Waals potential 28
variable angle spectroscopic ellipsometry
113
vibrational relaxation 106
vibrations of overlayers 37
Voigt's lineshape 178
voltammogram 47

w

waveguide 166