

## 9. Bibliography

- [ABI75] R.C. Alig and S. Bloom: Electron hole pair creation energies in semiconductors, Phys. Rev. Lett. **35** (1975) 1522
- [AEK92] A. Ausmees, M. Elango, A. Kikas, E. Nommiste, and A. Saar: Probing of electron-phonon scattering in ionic solids by XUV-induced electron emission spectroscopy, Surf. Sci. **269/270** (1992) 582
- [AHB71] S.L. Altmann, A.R. Harford, R.G. Blake: The band structure and Fermi surface of calcium, J. Phys. F **1**, 791 (1971).
- [AJG77] J.P. Albert, C. Jouanin, and C. Gout: Electronic band structure of fluorite, Phys. Rev. **B16**, (1977) 925
- [AMe76] N.W. Ashcroft and N.D. Mermin: Solid state physics, CBS Publishing, Saunders, 1976
- [AO76] R. Alcalá and M. Orera: Cation colloidal particles in alkaline earth fluorides, J. de Phys. **C7** 520 (1976)
- [Ash88] J.C. Ashley: Interaction of low energy electrons with condensed matter: stopping power and inelastic mean free path from optical data, J. El. Spectr. Rel. Phenom. **46** 199 (1988)
- [Ato79] K. Atobe: Thermoluminescence and  $F$  center annealing in alkaline earth fluoride crystals after reactor irradiation at low temperatures, J. Chem Phys. **71**, 2588 (1979)
- [ATO90] C. Akita, T. Tomioka, M. Owari, A. Mizuke, and Y. Hihei: A chemical state discriminated XPED study on structure of thin CaO layer formed by electron bombardment heating on CaF<sub>2</sub> (111), Japan. J. Appl. Phys. **29**, 2106 (1990)
- [AWa89] P. Avouris and R.E. Walkup: Fundamental mechanism of desorption and fragmentation induced by electronic transitions at surfaces, Annu. Rev. Phys.Chem. **40**, 173 (1989)
- [BAL94] S. Bouzidi, T. Angot, V. Langlais, J.-M. Debever, R. Sporken, J.L. Longueville, and P.A. Thiry: Inverse-photoemission spectroscopy of electron irradiated epitaxial CaF<sub>2</sub> on Si (111), Surf. Sci. **307-309**, (1994), 1038
- [Bar98] C. Barth: Dynamische Kraftmikroskopie an reinen und gasdosierten Fluoridoberflächen, Diploma thesis, Freie Universität Berlin, 1998
- [BBo39] H. Bruining and J.H. de Boer: Physica **6** 834 (1939)
- [BCa85] P. Blaha, J. Callaway: Electronic structure and Fermi surface of calcium, Phys. Rev. B **32**(12), 7664 (1985).
- [Ben97] R. Bennewitz: Kraftmikroskopie an CaF<sub>2</sub>(111): Charakterisierung der reinen und der elektronenstrahlmodifizierten Oberfläche, Dissertation, Wissenschaftliche Schriftenreihe Physik, Band 59, Berlin, Köster 1997
- [Bez91] D.F. Bezuidenhout: Calcium difluoride (CaF<sub>2</sub>), in E.D. Palik (ed): Handbook of optical constants of solids II, Academic press, San Diego 1991
- [BFr61] I.M. Bronshtein and B.S. Fraiman: Determining the path lengths of slow secondary electrons, Sov. Phys. Sol. Stat. **3** 995 (1961)
- [BGR95] R. Bennewitz, C. Günther, M. Reichling, E. Matthias, S. Vijayalakshmi, A.V. Barnes, and N.H. Tolk: Size evolution of low energy electron generated Ca-colloids in CaF<sub>2</sub>, Appl. Phys. Lett. **66**, (1995) 320
- [BHH72] J.H. Beaumont, A.L. Harmer, and W. Hayes: The  $F_3$  center in alkaline earth fluorides, J. Phys. Chem. **5** (1972) 257
- [BHK70] J.H. Beaumont, W. Hayes, D.L. Kirk, G.P. Summers: An investigation of trapped holes and trapped excitons in alkaline earth fluorides, Proc. Roy. Soc. Lond. **A. 315**, 69 (1970)

- [BJC90] J. Barth, R.L. Johnson, M. Cardona, D. Fuchs, and A.M. Bradshaw: Dielectric function of CaF<sub>2</sub> between 10 and 35 eV, Phys. Rev. **B41**, 291 (1990)
- [BJS93] A.R. Burns, E.B. Stechel, and D.R. Jennison, (eds.): Desorption Induced by Electronic Transitions DIET V, Springer Series in Surface Science 31, Springer Verlag, Berlin 1993
- [Bou97] N.Y. Bouchaala: Optische Spektroskopie an Metallkolloiden und Farbzentren in CaF<sub>2</sub> und LiF, Diploma thesis, Freie Universität Berlin, 1997
- [BRM97] R. Bennewitz, M. Reichling, and E. Matthias: Force microscopy of cleaved and electron irradiated CaF<sub>2</sub> (111) surfaces in ultra-high vacuum, Surface Science **387** (1997) 69
- [BRW94] R. Bennewitz, M. Reichling, R.M. Wilson, R.T. Williams, K. Holldack, M. Grunze, and E. Matthias: Characterization of Ca aggregates on CaF<sub>2</sub> (111)-surfaces by atomic force, XPS, and fluorescence microscopy, Nucl. Instr. and Meth. in Phys. Res. **B91** (1994) 623
- [BSp64] C.N. Berglund and W.E. Spicer: Photoemission studies on copper and silver: Theory, Phys. Rev. **136** (1964) A1030
- [BSR95] R. Bennewitz, D. Smith, M. Reichling, E. Matthias, N. Itoh, and R.M. Wilson: Electron stimulated desorption from CaF<sub>2</sub>: penetration depth of electrons and sample charging, Nucl. Instr. and Meth. in Phys. Res. **B101** 118 (1995)
- [BSR98] R. Bennewitz, D. Smith, and M. Reichling: Bulk and surface processes in low-energy electron induced decomposition of CaF<sub>2</sub>, Phys. Rev. **B**, in print
- [BZe90a] S. Baunack, A. Zehe: Electron-Beam-Induced Decomposition of MBE grown CaF<sub>2</sub> films: an AES study. Vacuum **41**, 1003 (1990).
- [BZe90b] S. Baunack, A. Zehe: Electron-Beam-Induced Decomposition and Oxidation of Thin CaF<sub>2</sub>-Layers on Si(111) Studied by Auger Electron Spectroscopy, Surf. Sci. **225**, 292 (1990).
- [Caz86] J. Cazaux: Some considerations on the electric field induced in insulators by electron bombardement, J. Appl. Phys. **59** 1418 (1986)
- [CDV93] V. Chakarian, T.D. Durbin, P.R. Varekamp, and J.A. Jarmoff: Formation of surface *F* centers on CaF<sub>2</sub>/Si (111), Phys. Rev. **B 48**, (1993) 18332
- [CDV94] V. Chakarian, T.D. Durbin, P.R. Varenkamp, and J.A. Yarmoff: Radiation damage of epitaxial CaF<sub>2</sub> overlayers on Si (111) studied by photon-stimulated desorption: Formation of surface *F* centers, J. Vac. Sci. Technol. **A12** (1994) 2159
- [CEH74] P.H. Citrin, P. Eisenberger, and D.R. Haman: Phonon broadening of X-ray photoemission linewidth, Phys. Rev. Lett. **33**, (1974) 965
- [CHH69] B.C. Cavenett, W. Hayes, I.C. Hunter, and A.M. Stoneham: Magneto-optical properties of *F*-centers in alkaline-earth fluorides, Proc. Roy. Soc. London, Ser. A, **309** (1969) 53
- [CJe95] L. Cieplinski and C. Jedrzejek: Classical trajectories studies of DIET from calcium fluoride, Surf. Sci **339** (1995) L940
- [CNo73] C.R.A. Catlow and M.J. Norgett: Shell model calculations of the energies of formation and of point defects in alkaline earth fluorides, J. Phys. C **6** (1973) 1325
- [Col73] W.C. Collins: The M<sup>+</sup>-center in CaF<sub>2</sub>, Phys. Stat. Sol. **56**, (1973), 291
- [CTR91] K.M. Colbow, T. Tiedje, D. Rogers, and W. Eberhardt: Photoemission study of the formation of the CaF<sub>2</sub>/GaAs (100) interface, Phys. Rev. **B43**, (1991) 9672
- [CSo95] Y.Cai and K.S. Song: Excitonic instability and desorption of F from CaF<sub>2</sub> crystal, Nucl. Instr. and Meth. in Phys. Res. **B101**, (1995) 115
- [CW86] P.A. Cox and A.A. Williams: Surface excitons on ionic crystals, Surf. Sci **175**, (1986) L782

- [DMK97] M. Dähne-Prietsch, I. Manke, T. Kalka, H.J. Wen, and G. Kaindl: Low density of states at the epitaxial  $\text{CaF}_2/\text{Si}(111)$  interface, *J. Phys. D: Appl. Phys.* **30** L48 (1997)
- [DRH95] J.D. Denglinger, E. Rotenberg, U. Hessinger, M. Leskovar, and M. Olmstead: Growth kinetics of  $\text{CaF}_2/\text{Si}(111)$  heteroepitaxy: An x-ray photoelectron diffraction study, *Phys.Rev.* **B51**, 5352 (1995)
- [FUm93] H.J. Freund and E. Umbach: Adsorption on ordered surfaces of ionic solids and thin films, Springer Series in Surface Science 33, Springer Verlag, Berlin 1993
- [EAN87] R.C. Estler, E.C. Apel, and N.S. Nogar: Laser mass-spectroscopy studies of optical damage in  $\text{CaF}_2$ , *J. Opt. Soc. Am.* **B4** (1987), 281
- [ECG92] W. Eberhardt, K.M. Colbow, Y. Gao, D. Rogers, and T. Tiedje: Photon-stimulated desorption from  $\text{CaF}_2$  and  $\text{BaF}_2$  thin films grown epitaxially on GaAs (100) surfaces, *Phys. Rev.* **B46**, (1992) 12388
- [EHi80] W. Eberhardt and F.J. Himpsel: Dipole selection rules for optical transitions in the fcc and bcc lattices, *Phys. Rev.* **B21**, (1980) 5572
- [EKü85] G. Ertl and J. Küppers: Low energy electrons and surface chemistry, VHC Verlagsgesellschaft, Weinheim 1985
- [FDB85] M.V. Fischetti, D.J. DiMaria, S.D. Brorson, T.N. Theis, and J.R. Kirtley: Theory of high-field electron transport in silicon dioxide, *Phys. Rev.* **B31** (1985) 8124
- [Gil60] J.J. Gilman: Direct measurement of the surface energy of crystals, *J. Appl. Phys.* **31**, 2208 (1960)
- [GKu79] W. Gudat and C. Kunz: in C. Kunz (Ed.) Topics in Current Physics 10, Springer Verlag, Berlin, 1979
- [Gog96] Stephan Gogoll: Über die Laserschädigung von  $\text{CaF}_2$  mit Nanosekundenpulsen, PhD thesis, Freie Universität Berlin 1996
- [Gol94] F. Golek: KCL crystal surface charging measurements by AES, *Phys. Stat. Sol. (B)* **185** K16 (1994)
- [GRC89] T.A. Green, M.E. Riley, and M.E. Coltrin: Molecular-Dynamics Simulation of Positive-Ion and Neutral Halogen Desorption Following Na K-Shell Auger Cascades in the NaF Crystal, *Phys. Rev.* **B39** (1989) 5397
- [GSJ96] S. Gogoll, E. Stenzel, H. Johansen, M. Reichling, and E. Matthias: Laser-damage of cleaved and polished  $\text{CaF}_2$  at 248 nm, *Nucl. Instr. and Meth. Phys. Res.* **116**, (1996) 279
- [Gün94] C. Günther: Optische Spektroskopie an Calciumkolloiden und Farbzentren in  $\text{CaF}_2$ , Diploma thesis, Freie Universität Berlin 1994
- [GXH92] F. Gan, Y.N. Xu, M.Z. Huang, W.Y. Ching, and J.G. Harrison: Optical properties of a  $\text{CaF}_2$  crystal, *Phys. Rev.* **B45** (1992) 8248
- [Hay74] W. Hayes (ed.): *Crystals with the fluorite structure*, Oxford University Press, London 1974
- [HBB98] M. Huisinga, N. Bouchaala, R. Bennewitz, E.A. Kotomin, M.Reichling, V.N. Kuzovkov, and W. von Niessen: The kinetics of  $\text{CaF}_2$  metallization induced by low energy electron irradiation, *Nucl. Instr. and Meth. in Phys. Res.* **B141** 79 (1998)
- [HGö91] M. Henzler and W. Göpel: Oberflächenphysik des Festkörpers, Teubner Studienbücher, B.G. Teubner Verlag, Stuttgart 1991
- [HHM89] F.J. Himpsel, T.F. Heinz, A.B. McLean, E. Palange, and E. Burnstein: Two-dimensional energy bands at the  $\text{CaF}_2/\text{Si}(111)$  interface, *J. Vac. Sci. Technol.* **B7** (1989) 879
- [HHS88] K. Horn, A. Hohlfeld, J. Somers, T. Lindner, P. Hollins, and A.M. Bradshaw: Identification of the s-derived valence-electron level in photoemission from alkali-metal adlayers on aluminium, *Phys. Rev. Lett.* **61**, (1988) 2488

- [HJa79] A.E. Hughes and S.C. Jain: Metal colloids in ionic crystals, *Advances in Physics* **28**, (1979) 717
- [HLi80] R.A. Heaton and C.C. Lin: Electronic energy-band structure of the calcium fluoride crystal, *Phys. Rev.* **B22**, (1980) 3629
- [HLO95] U. Hessinger, M. Leskovar, and M. Olmstead: Role of step and terrace nucleation in heteroepitaxial growth morphology. growth kinetics of CaF<sub>2</sub>/Si (111) *Phys. Rev. Lett.* **75**, 2380 (1995)
- [HMD82] T.R. Harrison, P.M. Mankievich, and A.H. Dayem: Thin film CaF<sub>2</sub> inorganic resist and optical-read storage medium, *Appl. Phys. Lett.* **41** (1982) 1102
- [HNR76] P. Heimann, H. Neddermeyer, and H.F. Roloff: Photoemission from (110) faces of noble metals: observation of the one-dimensional density of states, *Phys. Rev. Lett.* **37**, (1976) 775
- [Hof92] C. Hofmann: Calcium fluoride for high-performance optics: problems and solutions, *Materials&Design*, **13** (1993) 167
- [HPR98] M. Huisinga, V.E. Puchin, and M.Reichling: Photoemission from pure and electron irradiated CaF<sub>2</sub>, *Nucl. Instr. and Meth. in Phys. Res.* **B141** 528 (1998)
- [HRa78] J.T.J. Huang and J.W. Rablais: X-ray photoelectron cross-sections and angular distributions, in: C.R. Brundle and A.D. Baker (eds.): *Electron spectroscopy: Theory, techniques and applications*, Academic press, London 1978
- [HRM97] M. Huisinga, M.Reichling, and E. Matthias: Ultraviolet photoelectron spectroscopy and photoconductivity of CaF<sub>2</sub>, *Phys. Rev.* **B55**, 7600, (1997)
- [HSt75] F.J. Himpsel and W. Steinmann: Angle and energy dependance of photoemission from NaCl and KCl single crystals, *Phys. Rev. Lett.* **35**, 1025 (1975)
- [HSt78] F.J. Himpsel and W. Steinmann: Angle-resolved photoemission from the NaCl (100) face, *Phys. Rev.* **B17**, 2537 (1978)
- [HTL92] F.J. Himpsel, L.J. Terminello, D.A. Lapiano-Smith, E.A. Eklund, and J.J. Barton: Band dispersion of localized valence states in LiF(100), *Phys. Rev. Lett.* **68**, 3611 (1992)
- [Hüf96] S. Hüfner: *Photoelectron spectroscopy*, Springer Series in Solid State Physics 82, Springer Verlag, Berlin Heidelberg 1996
- [Hui94] M. Huisinga: *Ultravioletphotoelektronenspektroskopie an elektronenstrahl-induzierten Defekten in CaF<sub>2</sub>*, Diploma thesis, Freie Universität Berlin, 1994
- [HVS97] H.J. Hopman, J. Verhoeven, J.J. Scholtz, and R. Fastenau: Time variation of secondary electron emission during electron bombardement of rutile, *Applied Surface Science* **111** 270 (1997)
- [ICR96] O. Ibara, J. Cazaux, G. Remond, and C.Gilles: Halogen ion electric field driven diffusion in fluorite and polyvinyl chloride during electron irradiation, *J. Appl. Phys.* **79**, (1996) 2309
- [ICT95] O. Ibara, J. Cazaux, and P. Trebbia: Sodium diffusion in glasses during electron irradiation, *J. Appl. Phys.* **78**, (1995) 868
- [IKu77] M. Ivan and C. Kunz: Investigation of the phonon broadening of core levels in NaCl, *Phys. Lett* **60A**, (1977) 345
- [IMu81] M. Isaacson and A. Murray: In situ vaporization of very low molecular weight resists using ½ nm diameter electron beams, *J. Vac. Sci. Technol.* **19** (1981) 1117
- [ITF94] A. Izumi, K. Tsutsui, and S. Furukawa: Surface modification of CaF<sub>2</sub> on Si(111) by low-energy electron beam for over growth of GaAs films, *J. Appl. Phys.* **75**, 2307 (1994)
- [JCh83] E. Johnson and L.T. Chadderton: Anion voidage and the void superlattice in electron irradiated CaF<sub>2</sub>, *Rad. Effects* **79** 183 (1983)

- [JGS95] H. Johansen, S. Gogoll, E. Stenzel, and M. Reichling: Scanning electron microscopical inspection of uncoated CaF<sub>2</sub> single crystals, *Phys. stat. sol (a)* **150**, (1995) 613
- [JGS95] H. Johansen, S. Gogoll, E. Stenzel, M. Reichling, and E. Matthias: SEM-analysis of fracture features formed in excimer-laser induced surface damage of CaF<sub>2</sub>, *Rad. Eff. and Def. in Solids* **136**, (1995) 151
- [Jos79] K. Jost: Novel design of a "spherical" electron spectrometer, *J. Phys. E: Sci. Instrum.* **12**, 1006 (1979)
- [KFe78] M.L. Knotek and P.J. Feibelman: Ion desorption by core-hole auger decay, *Phys. Rev. Lett.* **40** (1978) 964,
- [KFe79] M.L. Knotek and P.J. Feibelman: Stability of ionically bonded surfaces in ionizing environments, *Surf. Sci.* **90** (1979) 78
- [KHM86] U.O. Karlsson, F.J. Himpsel, J.F. Morar, F.R. Mc Feely, D. Rieger, J.A. Yarmoff: Formation of a new ordered structure of CaF<sub>2</sub>/Si (111) by ultraviolet irradiation, *Phys. Rev. Lett.* **57**, 1247 (1986)
- [Kit91] C. Kittel: *Einführung in die Festkörperphysik*, Oldenbourg Verlag, München, 9. Auflage 1991
- [KOI95] J. Kanasaki, A. Okano, K. Ishikawa, and N. Itoh: The DIET from semiconductor surfaces by excitation of valence electrons, *Nucl. Instr. and Meth. in Phys. Res.* **B101** 93 (1995)
- [KVV77] R.B. Kay, Ph.E. Van der Leeuw, and M.J. Van der Weil: Ionic fragmentation and post-collision interaction in the Auger decay of carbon-K ionized CO, *J. Phys.* **B10**, (1977), 2521
- [LKM81] L. Ley, G.P. Kerker, and N. Martensson: Surface electronic structure from calcium, strontium, and barium, *Phys. Rev.* **B23**, (1981) 2710
- [LKR94] A. Lehmann, G. König, and K.H. Rieder: Water adsorption on perfect CaF<sub>2</sub> (111) studied with He-scattering, Experimental evidence for ordering of nanoclusters, *Phys. Rev. Lett.* **73**, (1994), 3125
- [LKR95] A. Lehmann, G. König, and K.H. Rieder: He-diffraction study of defect correlated water adsorption on the CaF<sub>2</sub> (111) surface, *Chem. Phys. Lett.* **235**, (1995), 65
- [Lüt95] H. Lüth: *Surfaces and Interfaces of solid Materials*, 3<sup>rd</sup> edition, Springer Verlag Berlin 1995
- [Mah70] G.D. Mahan: Theory of photoemission in simple metals, *Phys. Rev.* **B2** (1970) 4334
- [Mah80] G.D. Mahan: Photoemission from alkali halides: Energies and line shape, *Phys. Rev.* **B21** (1980) 4791
- [Man68] J.R. Manning: *Diffusion kinetics for atoms in crystals*, D. van Nostrand Company, Princeton 1968
- [MAw68] K. Muto and K. Awazu: Oxygen penetration into CaF<sub>2</sub>:Sm<sup>2+</sup> crystals, *J. Phys. Chem. Solids* **29**, 1269 (1968)
- [MBe75] S.S. Mitra and B. Bendow: *Optical properties of highly transparent solids*, Plenum Press, New York 1975
- [MCM89] R. Mamy, B. Carricaburu, A. Munoz-Yague, and C. Fontaine: CaF<sub>2</sub>/Si and CaF<sub>2</sub>/GaAs interface formation: a photoemission study, *Surf. Sci.* **222** (1989) 119
- [MEv68] S.D. Mc Laughlan and H.W. Evans: Production of colloidal calcium by electron irradiation of CaF<sub>2</sub> crystals, *Phys. Stat. Sol.* **27** 695 (1968)
- [MFS93] A. Manescau, F.J. Fuentes, V. Sanches: Optical design of the 1-5 microns infrared camera of the IAC, *SPIE Buch*, 587, 1993, *Infrared Detectors and Instrumentation*, SPIE Proc. Vol 1946, A.M. Fowler
- [MSS91] K. Miura, K. Sugiura, and H. Sugiura: F<sup>+</sup> desorption mechanism from CaF<sub>2</sub> (111) surfaces by low-energy electron irradiation, *Surf. Sci. Lett.* **253** L407 (1991)

- [Mur74] L.E. Murr: Transmission electron microscope study of crystal defects in natural fluoride, *phys. stat. sol. (a)* **22** (1974) 239
- [NSt73] M.J. Norgett, A.M. Stoneham: The self trapped hole in alkalin earth fluorides: I static properties, *J. Phys. C: Solid State Phys.* **6**, 229 (1973),  
M.J. Norgett, A.M. Stoneham: The self trapped hole in alkalin earth fluorides: II hopping motion, *J. Phys. C: Solid State Phys.* **6**, 238 (1973)
- [OAI76] V.M. Orera and E. Alcala: Formation and size evolution of Ca colloids in additively colored CaF<sub>2</sub>, *phys. stat. sol.* **38**, (1976), 621
- [OAI77] V.M. Orera and E. Alcala: Optical properties of cation colloidal particles in CaF<sub>2</sub> and SrF<sub>2</sub>, *phys. stat. sol.* **44**, (1977), 717
- [OAI78] V.M. Orera and E. Alcala: Photothermal bleaching of Ca colloids in additively colored CaF<sub>2</sub>, *Sol. state comm.* **27** (1978) 1109
- [OBK98] D. Ochs, M. Brause, S. Krischok, P. Stracke, W. Maus-Friedrichs, V. Puchin, A. Popov, and V. Kempter: Characterization of LiF and CaF<sub>2</sub> surfaces using MIES and UPS (HeI), *J. El. Spec. and rel. Phen.* **88-91**, (1998) 725
- [OBr90a] M.A. Olmstead and R.D. Bringans: Initial stages of epitaxial semiconductor-insulator heterointerface formation, *J. El. Spec. Rel. Phen.* **51**, (1990) 599
- [OBr90b] M.A. Olmstead and R.D. Bringans: Role of lattice mismatch and surface chemistry in the formation of epitaxial semiconductor-insulator interfaces, *Phys. Rev.* **B41** 8420 (1990)
- [OOH80] F. Ohuchi, M. Ogino, P.H. Holloway, and C.G. Pantano: *Surf. Interface Analysis* **2** 619 (1980)
- [OUB87] M.A. Olmstead, R.I.G. Uhrberg, R.D. Bringans, R.Z. Bachrach: Photoemission study of bonding at the CaF<sub>2</sub>-on-Si (111) interface, *Phys. Rev.* **B35**, (1987) 7526
- [Pal68] P.W. Palmberg: Secondary emission studies of Ge and Na-covered Ge, *J. Appl. Phys.* **38** (1968) 2137
- [PEb82] E.W. Plummer and W. Eberhardt: Angle resolved photoemission as a tool for the study of surfaces, *Adv. Chem. Phys.* **49** (1982) 533
- [PMM94] P.O. Peterson, R.J. Miles, and T.C. McGill: Surface morphology of silicon grown on CaF<sub>2</sub>/Si by electron beam assisted molecular.beam epitaxy, *J. Appl. Phys.* **76** (1994) 7328
- [PPB80] W. Pong, D. Paudyal, and D. Brandt: UV photoemission study of air cleaved LiF, *J. El. Spec. Rel. Phen.* **21**, 261 (1980)
- [PPH98a] A.V. Puchina, V.E. Puchin, M. Huisinga, R. Bennowitz, and M. Reichling: Theoretical modelling of steps and surface oxydation on the CaF<sub>2</sub> (111), *Surf. Sci* **402-404**, (1998), 687
- [PPH98b] V.E. Puchin, A.V. Puchina, M. Huisinga, and M. Reichling: Theoretical modelling of steps on the CaF<sub>2</sub> (111) surface, submitted to *Phys. Rev. B*
- [PPK98] A.V. Puchina, V.E. Puchin, E.A. Kotomin, and M. Reichling: Ab initio study of the *F* centers in CaF<sub>2</sub>: calculations of the optical absorption, diffusion and binding energies, *Sol. State Comm.* **106**, (1998) 285
- [PSL75] R.T. Poole, J. Szajman, R.C.G. Leckey, J.G. Jenkin, and J. Liesegang: Electronic structure of the alkaline earth fluorides studied by photoelectron spectroscopy, *Phys. Rev.* **B12**, (1975) 5872
- [Puc98] V.E. Puchin: unpublished result
- [QSW92] B. Quiniou, W. Schwarz, Z. Wu, R.M. Osgood, Q. Yang, and J.M. Phillips: Photoemission from thick overlying epitaxial layers of CaF<sub>2</sub> on Si (111), *Appl. Phys. Lett.* **60**, (1992) 183
- [Rei93] L. Reimer: Tutorial texts in optical engineering: Vol TT12, SPIE Optical engineering press, Bellingham 1993

- [Rei95] M. Reichling: The role of defect diffusion and metallization for electron-stimulated desorption from CaF<sub>2</sub>, Nucl. Instr. and Meth. in Phys. Res. **B 101** (1995) 108
- [RHK87] D. Rieger, F.J. Himpsel, U.O. Karlsson, F.R. McFeely, J.F. Morar, J.A. Yarmoff: Electronic structure of the CaF<sub>2</sub>/Si (111) interface, Phys. Rev. **B 34**, 7526 (1987)
- [RHO98] M. Reichling, M. Huisinga, D. Ochs, and V. Kempter: Electron and photon stimulated metallization and oxidation of the CaF<sub>2</sub> (111) surfaces, Surf. Sci. **402-404**, (1998), 145
- [Rub72] G.W. Rubloff: Far-ultraviolet reflectance spectra and the electronic structure of ionic crystals, Phys. Rev. **B 5**, 662 (1972)
- [RWB96] M. Reichling, R.M. Wilson, R. Bennewitz, R.T. Williams, S. Gogoll, E. Stenzel, E. Matthias: Surface colloid evolution during low-energy electron irradiation of CaF<sub>2</sub>(111), Surf. Sci. **366**(3), 531 (1996).
- [SFa89] C.J. Schowalker and R.W. Fathauer: Growth and characterization of single crystal insulators on silicon, Crit. Rev. in Sol. State and Mat. Sci. **15** (1989) 367
- [SGS97] E. Stenzel, S. Gogoll, J. Sils, M. Huisinga, H. Johansen, G. Kästner, M. Reichling, and E. Matthias: Laser damage of alkaline-earth fluorides at 248 nm and the influence of polishing grades, Appl. Surf. Sci. **109/110**, 162 (1997)
- [SHS68] A.M Stoneham, W. Hayes, P.H.S. Smith, and J.P. Stott: Hyperfine interaction of *F* centers in alkaline earth halides, Proc. Roy. Soc. Lond. Ser. A **306** (1968) 369
- [SLK96] E. L. Shirley, L.J. Terminello, J.E. Klepeis, and F.J. Himpsel: Detailed theoretical photoelectron angular distribution for LiF(100), Phys. Rev. **B53**, 10296 (1996)
- [SLo83] V.D. Scott and G. Love (eds.): Quantitative Electron-Probe Microanalysis, (Ellis Horwood Ltd, Chichester 1983 )
- [SMa78] M. Svantner and E. Mariani: Influence of oxygen on electrical properties of CaF<sub>2</sub>, Kristall und Technik **13**, 1431 (1978)
- [SMG81] C.L. Strecker, W.E. Moddeman, J.T. Grant: Electron-beam-induced decomposition of ion bombarded calcium fluoride surfaces, J. Appl. Phys. **52**(11), 6921 (1981).
- [SMo95] B. Stankiewicz and P. Modrak: Surface electronic structure calculation of CaF<sub>2</sub>, Surf. Sci **331-333** (1995) 1441
- [SPA84] T.P. Smith, J.M. Phillips, W.M. Augustyniak, and P.J. Stilles: Fabrication of metal-epitaxial insulator field effect transistors using molecular beam epitaxy of CaF<sub>2</sub> on Si, Appl. Phys. Lett. **45** (1984) 907
- [SPo95] M. Szymonski and Z. Postawa (eds): Desorption Induced by Electronic Transitions DIET VI, Nucl. Instr. Meth. Phys. **B101** (1995)
- [SSA81] N.V. Starostin, M.P. Shepilov, and A.B. Alekseev: Energy structure of the alkaline earth fluorides, phys. stat. sol. (b) **103**, (1981) 717
- [SSA87] K. Saiki, Y. Sato, K. Ando, A. Koma: In-Situ observation of defect formation in CaF<sub>2</sub>(111) surfaces induced by low energy electron bombardment, Surf. Sci. **192**, 1 (1987).
- [SSH97] J.J. Scholtz, R.W.A. Schmitz, B.H.W. Hendriks, and S.T. de Zwart: Description of the influence of charging on the measurement of the secondary electron yield of MgO, Appl. Surf. Sci **111** (1997) 259
- [SSK92] K. Saiki, Y. Sato, and A. Koma: Auger electron spectrum and electron energy loss spectrum of oxygen adsorbed CaF<sub>2</sub> (111) surfaces, Physica Scripta **T41**, 255 (1992)
- [Ste97] E. Stenzel: Der Einfluß von Kristalldefekten auf die Laserinduzierte Desorption von Erdalkalifluoriden, PhD thesis, Freie Universität Berlin, 1997
- [STK96] E.L. Shirley, L.J. Terminello, J.E. Klepeis, and F.J. Himpsel: Detailed photoelectron angular distribution for LiF(100), Phys. Rev. **B 53**, (1996) 10296

- [Sto89] A.M. Stoneham (editor): *Ionic Solids at High Temperatures*, Directions in Condensed Matter Physics 2, World Scientific Publ. Co., Singapore 1989
- [SWi93] K.S. Song, R.T. Williams: *Self-Trapped Excitons*, Springer Ser. in Solid-State Sci. 105, Springer-Verlag Berlin-Heidelberg 1993
- [SWS94] T. Suemasu, M. Watanabe, J. Suzuki, Y. Kohno, M. Asada, and N. Suzuki: Metal (CoSi<sub>2</sub>) / insulator (CaF<sub>2</sub>) resonant tunneling diode, *Jpn. J. Appl. Phys.* **33**, 57 (1994)
- [SXX93] K. Saiki, W.R. Xu, and A. Koma: A novel surface excitation in highly ionic fluorides, *Surf. Sci.* **287/288** (1993) 644
- [SYP97] A. Shih, J. Yater, P. Pehrson, J. Butler, C. Hor, and R. Abrams: Secondary electron emission from diamond surfaces, *J. Appl. Phys.* **82** 1860 (1997)
- [Tas80] P.W. Tasker: The structure and properties of fluorite crystal surfaces, *Journal de physique C6* **41**, 488 (1980)
- [TKI89] K. Tanimura, T. Katoh, and N. Itoh: Lattice relaxation of highly excited Self Trapped Excitons in CaF<sub>2</sub>, *Phys. Rev.* **B 40**, 1282 (1989)
- [Twi71] J.W. Twidell: Radiation induced movement of charge compensating ions in CaF<sub>2</sub>, *J. Chem. Phys. Sol.* **31** 299 (1971)
- [Ure57] R.W. Ure: Ionic conductivity of Calcium fluoride crystals, *J. Chem. Phys.* **26**, 1363 (1957)
- [Var54] J.H.O. Varley: A mechanism for the displacement of ions in an ionic lattice, *Nature* **174**, (1954) 886
- [WAG88] R.E. Walkup: Ph. Avouris, and A.P. Ghosh, The origin of positive ions and excited neutrals in electron stimulated desorption from alkali halides, in: R.H. Stullen and M.L. Knotek (eds): *Desorption induced by electronic transitions (DIET) 3*, Springer Series in Surface Science 13, Springer Verlag Berlin, 1988
- [WAv86] R.E. Walkup and Ph. Avouris: Classical-trajectory studies of electron- or photon-stimulated desorption from ionic solids, *Phys. Rev. Lett.* **56**, 524 (1986)
- [Wea74] R.C. Weast (ed.): *Handbook of chemistry and physics*, CRC press, Cleveland 1974
- [WHS90] W. Weiss, R. Hornstein, D. Schmeisser, and W. Göpel: Electronic and geometric study of clean InP and of the CaF<sub>2</sub>/InP(001) interface, *J. Vac. Sci. Technol.* **B 8** 715 (1990)
- [Wil77] P.M. Williams: Ultraviolet photoemission from solids, in: D. Briggs (ed.): *Handbook of X-ray and ultraviolet photoelectron spectroscopy*, Heyden & Son Ltd., London 1977
- [WPa97] E.M. Williams and R.E. Palmer (eds.): *Desorption induced by electronic transitions DIET VII*, *Surf. Sci.* **390** (1997)
- [WRB95a] G.K. Wertheim, J.E. Rowe, D.N.E. Buchanan, and P.H. Citrin: Experimental interatomic auger rates in sodium halides, *Phys. Rev.* **B 51**, (1995) 13669
- [WRB95b] G.K. Wertheim, J.E. Rowe, D.N.E. Buchanan, and P.H. Citrin: Valence-band structure of alkali halides determined from photoemission data, *Phys. Rev.* **B 51**, (1995) 13675
- [WRM89] E. Westin, A. Rosen, and E. Matthias: Molecular cluster calculation of the electronic structure of the (111) surface of CaF<sub>2</sub>, in G. Betz and P. Varga (eds.): *Desorption induced by electronic transitions DIET IV* (Springer Series in Surface Science 19) Springer Verlag, Berlin 1989
- [XVW89] F. Xu, M. Voß, and J.H. Weaver: Influence of Au overlayers on valence-band offsets for buried CaF<sub>2</sub>/Si(111) interfaces, *Phys. Rev.* **B 39**, 8008 (1989)
- [YCD95] J.A. Yarmoff, V. Chakarian, T.D. Durbin, C.W. Lo, D.K. Shuh, W.C. Simpson, and P.R. Varenkamp: *Nucl. Instr. and Meth. in Phys. Res.* **B 101** 60 (1995)

- [ZBG94] R. Zanetti, A.L. Bleloch, M.P. Grimshaw, and G.A.C. Jones: The effect of grain size on fluorine gas bubbles formation in calcium fluoride during electron-beam irradiation, *Phil. Mag. Lett.* **69** 285 (1994)
- [ZGT94] R. Zanetti, R.J. Guest, K.B.K. Tang, R.E. Palmer, M.P. Grimshaw, and G.A.C. Jones: Electron stimulated desorption of  $F^+$  ions from MBE grown  $Ca_{0.6}Sr_{0.4}F_2/GaAs$  (111), *Surf.Sci* **307-309**, 372 (1994)
- [ZRM92] J. Zink, J. Reif, and E. Matthias: Water adsorption on (111) surfaces of  $BaF_2$  and  $CaF_2$ , *Phys. Rev. Lett.* **68** 3595 (1992)

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V. Puchin, A. Puchina, M. Huisinga, M. Reichling, Theoretical modelling of steps on the  $\text{CaF}_2(111)$  surface, Phys. Rev. B, submitted

A.V. Puchina, V. E. Puchin, M. Huisinga, R. Bennowitz, M. Reichling, Theoretical modelling of steps and surface oxidation on  $\text{CaF}_2(111)$ , Surf. Sci. **402-404**, 687 – 691 (1998)

M. Reichling, M. Huisinga, D. Ochs, V. Kempter, Electron- and photon-stimulated metallization and oxidation of the  $\text{CaF}_2(111)$  surface, Surf. Sci. **402-404**, 145 – 149 (1998)

M. Huisinga, V.E. Puchin, M. Reichling, Photoemission from pure and electron irradiated  $\text{CaF}_2$ , Nucl. Instrum. Meth. B **141(1-4)**, 528 – 532 (1998)

M. Huisinga, N. Bouchaala, R. Bennowitz, E.A. Kotomin, M. Reichling, V.N. Kuzovkov, W. von Niessen, The kinetics of  $\text{CaF}_2$  metallization induced by low energy electron irradiation, Nucl. Instrum. Meth. B **141(1-4)**, 79 – 84 (1998)

E. Stenzel, S. Gogoll, J. Sils, M. Huisinga, H. Johansen, G. Kästner, M. Reichling, E. Matthias, Laser damage of alkaline-earth fluorides at 248nm and the influence of polishing grades, Appl. Surf. Sci. **109-110**, 162 - 167 (1997)

M. Huisinga, M. Reichling, E. Matthias, Ultraviolet-photoelectron spectroscopy and photoconductivity of  $\text{CaF}_2$ , Phys. Rev. B **55(12)**, 7600 - 7605 (1997)

M. Reichling, S. Gogoll, E. Stenzel, H. Johansen, M. Huisinga, E. Matthias, Laser-damage processes in cleaved and polished  $\text{CaF}_2$  at 248nm, in: H.E. Bennett, A.H. Guenther, M. Kozlowski, B.E. Newnam, M.J. Soileau (eds.): Laser-Induced Damage in Optical Materials 1995, SPIE Vol. 2714, Bellingham 1996, p. 260 - 271