Table S1. Overview of the vitamin A and CD complexes.

Vitamin or vitamin derivative	CD type	Molar ratio (vitamin:CD)	Preparation method	Analysis method	Aim of study/Application	First author, year of publication [Article No]
VA	EγCD, OγCD	1:1	Freeze-drying of water-ethanol solution	DSC, UV-Vis spectroscopy, HPLC	Increase of UV and temperature stability and solubility in water. Enhancement of skin permeation	Sapino 2007 [44]
VA	OAβCD, SAβCD	ND	Nanoprecipitation from ethanol solution	TGA, FTIR, DLS, TEM, $^{1}H/^{13}C$ NMR, FLS, MS	Improvement of stability to UV radiation	Kim 2016 [63]
VA, VA acetate, VA palmitate	βCD	1:2 (VA), 1:1 (VA esters)	Freeze-drying of water-ethanol solution	FTIR, ^{1}H NMR, SEM, UV-Vis spectroscopy, Mdoc	Enhancement of solubility and stability at elevated temperature	Xu 2021 [39]
VA palmitate	βCD	1:1, 1:2	Homogenization of VA palmitate suspension in CD's aqueous solution	FLS, UV-Vis spectroscopy	Determination of stoichiometry and association constants of complexes	Palmieri 1992 [46]
VA palmitate	αCD, βCD, γCD with addition of MD	ND	Kneading with small amounts of water (15% w/w) in elevated temperature and vacuum drying	UV-Vis spectroscopy, SEM	Enhancement of stability and solubility	Koeda 2014 [53]

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VA palmitate	βCD	1:1	Freeze-drying of phosphate buffer solution	DSC, TGA, SDTA, FTIR, UV-Vis spectroscopy	Increase of stability toward temperature, oxygen and UV light and enhancement of solubility in water	Vilanova 2015 [47]
VA acetate	HPβCD, HPγCD nanofibrous webs	1:2	Electrospinning of CDs aqueous solution mixed with VA acetate powder	SEM, ATR-FTIR, PXRD, DSC, TGA, ^{1}H NMR, UV-Vis spectroscopy	Preparation of novel fast-dissolving oral formulations with increased water solubility, enhanced bioavailability, stability and antioxidant activity	Celebioglu 2020 [45]
VA acetate	βCD functionalized PVA nanofibres	ND	Electrospinning of CDs/PVA aqueous solution mixed with VA acetate powder	PXRD, DSC, XPS, SWV, TGA, SEM	Prolongation of shelf life and increased thermal stability	Lemma 2015 [59]
VA propionate	DMβCD	1:10	Freeze-drying of aqueous solution	^{1}H/ROESY NMR, HPLC, MS	Increase of solubility, stability and skin penetration	Weisse 2002 [52]
VA propionate	αCD, βCD, γCD, DMβCD	1:1, 1:2	Freeze-drying of aqueous solution	^{1}H/ROESY NMR, HPLC, MS	Increase of solubility, stability and skin penetration	Weisse 2004 [57]
VA propionate	Chol-βCD-Ac	ND	Vacuum evaporation of acetone-aqueous solution of VA propionate and Chol-βCD-Ac with surfactant (Pluronic® PEF 68)	^{1}H/COSY/ROESY NMR, TEM, HPLC, PCS	Enhancement of stability and skin penetration	Weisse 2009 [74]

VA propionate	βCD	1:2	In silico	PM3, ONIOM2	Theoretical assessment of the inclusion complex geometry, stability and conformational changes of VA propionate in CD's cavity	Mallem 2011 [64]
retinal	βCD	ND	Evaporation of mixture of retinal's hexane solution and CD's aqueous solution and freeze-drying	FTIR, PXRD $^{1}H/^{13}C$ NMR, AFM	Enhancement of photochemical stability	Munoz-Botella 1996 [65]
RA	HPβCD	1:1, 1:2	Homogenization of RA suspension in CD's phosphate buffer solution	HPLC	Improvement of water solubility and photostability	Lin 2000 [71]
RA	βCD	1:1, 1:3	Freeze-drying	FTIR, ^{1}H NMR, HPLC	Protection against photo-degradation upon exposure to UV radiation and fluorescent light	Caddeo 2007 [49]
RA	DMβCD	1:1	Co-precipitation, freeze-drying, spray-drying, kneading with small amount of water	FTIR, ^{1}H NMR, DSC, PXRD, AFM, Raman spectroscopy, MM	Determination of stoichiometry and structure	Ascenso 2011 [69]
RA	DMβCD	1:4	Kneading without solvent	PCS, AFM, LDA, HPLC	Development of novel topical formulation with improved physicochemical parameters, e.g. loading capacity and chemical stability	Ascenso 2013 [51]
RA	βCD, DMβCD, HPβCD	1:1	Solvent evaporation from mixture of RA's ethanol	HPLC, SEM, FTIR, DSC, PXRD, ^{1}H NMR	Increase of solubility for topical use	Montassier 1997 [66]

			solution and CD's water solution			
RA	βCD, HPβCD	1:1	Kneading with small amount of hydroalcoholic solution	FTIR, DSC, MDoc	Improvement of solubility and tissue tolerability during topical use	Fathalla 2024 [54]
RA	DMβCD, TMβCD, DMγCD	1:2	Slow cooling of a homogenous solution of both components in water-ethanol mixture	UV-Vis spectroscopy	Acceleration of dissolution and increase of solubility for toxicological studies	Pitha 1983 [70]
RA	αCD, GalαCD	1:1, 1:2	Freeze-drying mixture of water solution of CD and ethanol solution of RA	^{1}H NMR, FTIR, PXRD	Increase of solubility for toxicological studies	Seo 2004 [56]
RA	αCD, HPβCD	1:1, 1:2	Freeze-drying of aqueous solution	DSC, FTIR, HPLC, PXRD, MDoc	Improvement of water solubility and photostability	Yap 2005 [58]
VA, retinal, VA acetate, RA	βCD, HPβCD, DMβCD, TMβCD	1:1, 1:2	Solvent evaporation from mixture of hexane or ethanol solution of retinoid and water solution of CD	UV-Vis spectroscopy, ^{1}H NMR, HPLC	Limiting photo-isomerization reactions, protection against photo and oxidative degradation	Munoz-Botella 2002 [48]
BC	HPβCD	ND	Co-precipitation from mixed aqueous solution of CD and acetone solution of BC	Raman spectroscopy, UV-Vis spectroscopy, HPLC	Protection from light, temperature, and oxygen	Celitan 2021 [61]

BC	βCD, γCD	1:4	Kneading with small amount of solvent (water) and freeze-drying	^{1}H NMR, DLS, MS	Study of large aggregates formation in aqueous solution	Mele 1998 [50]
BC	MβCD, HPβCD, HEβCD	1:1	Solvent evaporation after mixing dichloromethane solution of BC and ethanol solution of CD	FTIR, FLS, UV-Vis spectroscopy	Enhancement of water solubility, stability and antioxidant properties of BC	Celik 2017 [72]
BC	βCD	1:1	Co-precipitation from ethanol-water 25:75 (v/v) ultrasonicated mixture	FTIR, ^{1}H NMR, TEM	Increase of water solubility and bioavailability	Kaur 2016 [62]
BC	βCD-based nanosponges (CDNS) crosslinked with HMDI or EPI (1:4; 1:2 respectively)	ND	Solvent evaporation after mixing acetone solution of BC and water solution of CDNS and freeze-drying	FTIR, SEM, DLS, PXRD, DSC, UV-Vis spectroscopy	Development of BC carrier with improved solubility and stability	Yazdani 2021 [75]
BC	magnetic chitosan βCD biopolymer	ND	Extraction and evaporation	SEM, FTIR, TGA, HPLC	Development of ultrasonic-assisted solid phase extraction procedure for BC from vegetables	Dai 2019 [76]
BC	βCD, OSβCD	ND	Solvent evaporation after mixing acetone solution	FTIR, PXRD, ^{13}C CP/MAS NMR, AFM, SEM	Improvement of physical and	Niu 2019 [67]

			of BC and water/ethanol solution of CD		oxidative stability of the BC emulsion for food industry	
BC	HPβCD, HPγCD	ND	Electrospinning from aqueous solution of CD and BC	SEM, FTIR, PXRD	Increase of water-solubility and photostability, enhancement of antioxidant bioactivity	Yildiz 2023 [60]
VA	βCD	1:1	Kneading in mortar with pestle with addition of water	^{1}H NMR	Assessment of competition between bile acids and VA or VD3 in the formation of inclusion complexes for estimation of the risk of depletion of lipophilic vitamins after ingestion of βCD	Comini 1994 [55]
VA	αCD, βCD, MβCD, DMβCD, TMβCD, SBEβCD, HPβCD, HPαCD, HPγCD		Complexation in mixture of ethanol VA solution and PBS solution of CD	FLS, HPLC	Stabilization for ophthalmic purpose	Semenova 2002 [68]
VA	GluβCD	1:2	Complexation in aqueous solution	DSC, HPLC	Improvment of stability and solubility	Okada, 1990 [73]

Table S2. Overview of the vitamin D and CD complexes.

Vitamin or vitamin derivative	CD type	Molar ratio (vitamin:CD)	Preparation method	Analysis method	Aim of study/Application	First author, year of publication [Article No]
VD3	βCD	1:2	Microwave radiation	SEM, DSC, DTG, TG, FTIR, $^{1}H/^{13}C$ NMR	Enhancement of solubility and stability of VD3	Bakirova, 2020 [93]
VD3	βCD	1:2	Co-precipitation from ethanol-aqueous solution	SEM, IR, ^{13}C NMR, DTG, DSC, PXRD	Enhancement of photo and thermal stability	Szejtli, 1980 [42]
VD2-VD5, ProVD2-ProVD5	MβCD	ND	MβCD as mobile phase modifier	HPLC-MS, ^{1}H NMR	Improvement of separation of VD2-VD5 and their provitamins	Shimada, 1995 [104]
7-DHC	HPβCD	1:1	Freeze-drying	HPLC, FTIR, DSC, UV-Vis spectroscopy	Enhancement of solubility for cosmetic applications	Kim, 2010 [94]
VD3	βCD NLPs	1:1	Complexation in aqueous solution	FTIR, SEM	Development of new controlled release for nutritional therapy	Ebrahimi, 2023 [95]
VD2, VD3	GluβCD	1:2 (VD2), 1:1 (VD3)	Co-precipitation in aqueous solution and vacuum drying	DSC, HPLC	Enhancement of light stability and water solubility	Okada, 1990 [73]
VD3	βCD, γCD, PMβCD	ND	Complexation in J-medium/aqueous solution	HPLC	Acceleration and enhancing of VD3's microbial conversion to active metabolites	Takeda, 1994 [121]

VD2, VD3	βCD, DMβCD, HEβCD	ND	βCD, DMβCD, HEβCD as mobile phase modifiers	HPLC, MEKC	Improvement of separation of VD derivatives	Spencer,1997 [106]
VD2	βCD	1:1, 1:2	Spray-drying, evaporation, kneading	DSC, HPLC PXRD, ^{13}C NMR	Enhancement of solubility	Palmieri, 1993 [96]
		1:1:5, 1:1:10				
VD3	βCD	(ternary VD3:Al^{3+}: βCD complexes)	Evaporation of ethanolic-aqueous solution	PXRD, ^{13}C NMR	Development of new controlled release systems	Soares, 2012 [102]
PreD3	αCD, βCD, MβCD	1:1	Complexation in ethanolic-aqueous solution	HPLC, UV-Vis spectroscopy	Study of catalytic isomerization of PreD3 to VD3	Tian, 1995 [97]
VD3	βCDNS	1:4	Milling	TGA	Improvement of stability and absorption in gut-brain axis	Uberti, 2023 [100]
VD3	HPβCD	1:1, 1:2	Spray drying	MD, DSC, PXRD, FTIR, SEM	Enhancement of solubility	Wang, 2022 [98]
VD3 and its hydroxylated metabolites	γCD, MβCD	ND	γCD, MβCD as mobile phase modifiers	HPLC	Development of separation method for VD3 metabolites	Higashi, 2000 [105]

VD3	αCD, βCD, γCD, HPβCD	1:2,5, 1:5, 1:10	Evaporation of ethanolic-aqueous solution	FTIR, DSC, PXRD, UV-Vis spectroscopy, MM	Enhancement of stability and solubility	Braithwaite, 2017 [20]
VD3	βCD	1:1:5, 1:1:10 (ternary VD3:Co^{2+}:βCD, VD3:Cu^{2+}:βCD, VD3:Zn^{2+}:βCD complexes)	Evaporation of ethanolic-aqueous solution	PXRD, ^{13}C NMR, UV-Vis spectroscopy	Development of new controlled release systems	Merce, 2009 [101]
VD3	βCD	1:1	Kneading with small addition of water	^{1}H NMR	Assessment of competition between bile acids and VA or VD3 in the formation of inclusion complexes for estimation of the risk of depletion of lipophilic vitamins after ingestion of βCD	Comini, 1994 [55]
VD3	βCD	1:2	In silico	MD	Unraveling mechanism of catalytic isomerization of PreD3 to VD3	Ferro-Costas 2024 [99]

Table S3. Overview of the vitamin E and CD complexes.

Vitamin or	**CD type**	**Molar ratio**	**Preparation method**	**Analysis method**	**Aim of study/Application**	**First author, year of**

vitamin derivative		**(vitamin:CD)**				**publication [Article No]**
VE	HPGβCD	1:1	Co-precipitation in ethanolic-aqueous solution	^{1}H and ROESY NMR, HPLC	Improvement of solubility	Kimura, 2016 [122]
VE	βCD	1.7:1 (mixture of 1:1 and 1:2)	Co-precipitation in aqueous solution	ATR/FTIR, ^{13}C CP/MAS NMR, TGA, DSC	Enhancement of oxidative stability	Koontz, 2009 [123]
VE acetate	LRCD (25-30)	10:1	Co-precipitation in ethanolic-aqueous solution	FTIR	Enhancement of solubility	Kuttiyawong, 2015 [145]
VE	LRCD (26)	1:1	In silico	MD	Enhancement of solubility and stability	Kerdpol, 2021 [124]
VE	βCD (chitosan nanoparticles loaded with ternary inclusion complexes MOR/VE/βCD-CS NPs)	1:1	Co-precipitation in aqueous-acetone solution and freeze-drying	FTIR, DLS, ^{1}H NMR, DSC, XRD, AFM, TEM	Increase of hepatoprotective activity against arsenic toxicity	Mondal, 2022 [125]
VE	DMβCD	1:2, 1:3	Complexation in ethanolic-aqueous solution	ROESY NMR, radical scavenging assays	Enhancement of solubility and antioxidative properties	Ogawa, 2021 [139]

VE	γCD	1:2, 1:4	Complexation in ethanolic-aqueous solution	ROESY NMR, radical scavenging assays	Improvement of stabilization	Ogawa, 2021 [140]
VE	GluβCD	1:3	Co-precipitation in aqueous solution and vacuum drying	DSC, HPLC	Improvement of light stability and water solubility	Okada, 1990 [73]
VE	LRCD(26)	2:1	Complexation in aqueous solution	HPLC, MD	Enhanced solubility and stability	Sangkhawasi , 2023 [144]
VE	βCD HA grafted copolymers crosslinked with DPC	ND	Complexation in ethanolic-aqueous solution and freeze-drying	HPLC, FTIR, ^{1}H NMR, PXRD, SEM	Increased water solubility	Singh, 2020 [146]
VE	βCD	ND	Complexation in ethanolic-aqueous solution and vacuum drying	HPLC, DTG	Prolongation of antioxidative activity of LDPE films	Siró, 2006 [148]
VE	βCD loaded in sodium caseinate-coated nanoliposomes	1:1	Co-precipitation in ethanolic-aqueous solution and freeze-drying	UV-Vis spectroscopy, FTIR, TEM, PCS, SEM, TGA	Improvement of bioavailability and stability in nutraceuticals and medicines	Souri, 2021 [126]
VE, β-TOC, γ-TOC, δ-TOC, VE	βCD, DMβCD, HEβCD	nd	βCD, DMβCD, HEβCD as mobile phase modifiers	HPLC, MEKC	Improvement of separation of VE derivatives	Spencer, 1997 [106]

acetate						
VE, β-TOC, γ-TOC, δ-TOC, α-TOC3, γ-TOC3, δ-TOC3	DMβCD	1:1	Complexation in aqueous solution	^{1}H and ROESY NMR, EPR	Enhancement of solubility and radical scavenging activity	Sueishi, 2011 [127]
VE	βCD	1:1	Co-precipitation in ethanolic-aqueous solution, sonication, microwave radiation	FTIR, UV-Vis spectroscopy and FLS	Improved stability, solubility and bioavailability	Jiao, 2010 [128]
VE	ODSβCD	1:1	Co-precipitation in ethanolic-aqueous solution	SEM, FTIR, ^{13}C and NOESY NMR, PXRD, TEM, DLS	Utilization in stabilization of Pickering emulsion	Xi, 2019 [129]
VE	βCD amine derivatives	1:1, 1:2	Co-precipitation in ethanolic-aqueous solution and freeze-drying	UV-Vis spectroscopy, FLS, ^{1}H NMR, DLS, CirD, TEM	Improvement of stability, light and temperature protection	Zhang, 2018 [130]
VE	βCD HGNCs	1:1	Co-precipitation in aqueous solution	FTIR, DSC, PXRD, SEM, TEM, AFM, CLSM	Development of new controlled release systems with enhanced bioavailability	Eid, 2024 [131]
VE	MβCD	1:1	Co-precipitation in ethanol solution	ND	Study on protective effects of VE/MβCD on epididymal ram semen during cryopreservation	Benhenia, 2016 [132]

VE	MβCD	1:1	Freeze-drying of aqueous solution	ND	Study of protective effects of VE/MβCD on ram sperm during cryopreservation	Benhenia, 2018 [133]
VE	OSAβCD	1:10, 1:12, 1:16, 1:20, 1:25, 1:30	Co-precipitation from aqueous-isopropanol solution and freeze-drying	FTIR, ^{13}C CP/MAS NMR, PXRD, SEM, MDoc	Enhancement of physical and oxidative stability of emulsion	Ke, 2020 [143]
VE	HPβCD NFs	1:2, 1:1	Electrospinning	SEM, FTIR, DSC, PXRD, ^{1}H NMR, UV-Vis spectroscopy	Prolongation of shelf life and antioxidant activity, enhancement of water solubility and photostability	Celebioglu, 2017 [134]
VE	βCD PCL NFs	1:1	Electrospinning	PXRD, SEM, TGA	Enhancement of solubility, improved oxidative- and photostability in topical drug delivery	Aytac, 2016 [135]
VE	βCD	1:2, 1:4	Co-precipitation from aqueous-isopropanol solution and freeze-drying	TGA	Enhancement of thermal stability	Burkeev, 2021 [141]
VE	LRCD (9-22)	1:1, 1,5:1, 2:1, 2.5:1, 3:1	Co-precipitation in aqueous solution	^{1}H NMR, FTIR, TGA, SEM	Improvement of thermostability and antioxidant activity	Cao, 2020 [136]
α-TOC3, β-TOC3, γ-TOC3,	PMβCD	ND	PMβCD as mobile phase modifier	HPLC	Improvement of separation of TOC3 derivatives	Drotleff, 1998 [155]

δ-TOC3						
TOC3	γCD	ND	Complexation in aqueous solution and freeze-drying	HPLC, FLS	Enhancement of intestinal absorption in animals	Ikeda, 2010 [147]
VE	αCD, βCD, γCD, HPβCD	1:2,5, 1:5, 1:10	Evaporation of ethanolic-aqueous solution	FTIR, DSC, PXRD, UV-Vis spectroscopy, MM	Improvement of stability and solubility	Braithwaite, 2017 [20]
VE nicotinate, VE acetate	DMβCD	1:2	Kneading with small amount of water	PXRD, DTA, HPLC	Improvement of solubility and oral bioavailability	Uekama, 1988 [142]
VE acetate	βCD	1:1, 1:2, 1:3	Microwave radiation	FTIR, ^{1}H, ^{13}C NMR spectroscopy, SEM, MM (PM3)	Enhancement of stability for application in foods	Iskineyeva, 2021 [137]
VE	βCD, HPβCD, HPγCD	1:1, 1:2	Kneading with small amount of water-methanol solution (1:1, v:v), freeze-drying from aqueous and co-evaporation from water-methanol solution	HPLC, ^{1}H NMR	Increase of stability	Iaconinoto, 2004 [138]

Table S4. Overview of the vitamin K and CD complexes.

Vitamin or vitamin	**CD type**	**Molar ratio (vitamin:CD)**	**Preparation method**	**Analysis method**	**Aim of study/Application**	**First author, year of publication [Article No]**

derivative						
VK3	DMβCD	1:1	Co-precipitation from aqueous solution	UV-Vis spectroscopy, $^{1}H/^{13}C$ NMR, CirD	Enhancement of solubility and stability	Szejtli, 1982 [43]
VK3	γCD	1:1	Co-precipitation from aqueous solution, co-precipitation from hydroalcoholic solution, kneading with small amount of ethanol	PXRD, DTG, TG, DSC, UV-Vis spectroscopy	Improvement of bioavailability and stability for veterinary use	Lengyel, 1985 [158]
VK3	βCD	1:1	Complexation in aqueous solution	FLS	Determination of association constants of complexes and improvement of luminescence detection	Nevado, 2001 [159]
VK3	γCD	1:1	Complexing in aqueous solution	PXRD, FTIR UV-Vis spectroscopy, FLS	Studies on inclusion constants and interaction between VK3/γCD complex and herring sperm DNA for antiviral potential	Tang, 2016 [160]
VK3	βCD	1:1	In silico	QM calculations (Gaussian)	Thermodynamic studies of complex formation	Petkova, 2023 [40]
VK3	AMCDs	1:1	Complexation in aqueous solution	UV-Vis spectroscopy, TEM, DLS	Improvement of solubility and bioavailability	Li, 2019 [166]
VK1, VK2	GluβCD	1:3	Co-precipitation in aqueous solution and vacuum drying	DSC, HPLC	Improvement of light stability and water solubility	Okada, 1990 [73]
VK3	αCD, βCD, HPαCD, HPβCD, HPγCD, MβCD	1:1	Complexation in aqueous solution	UV-Vis spectroscopy, ^{1}H NMR, ITC	Improvement of solubility and analysis of thermodynamic properties	Zielenkiewicz, 2007 [161]

VK3	βCD, HPβCD, SBEβCD	1:1	Complexation in aqueous solution	FLS	Studies on interaction between VK's and CD's molecules in complex and complex structure. Optimization of fluorescence-based detection of VK3 inclusion complexes	Zhenming, 2003 [162]
VK3	βCD, γCD	1:1, 2:1	Complexation in water-ethylene glycol solution	PS	Studies on VK3 behavior under irradiation (photodimerization) and its stability	Kuboyama, 1984 [163]