Chemical Resistance of Aluminium in Contact with Important Agents

As a rule, the data apply to pure aluminum and aluminium copper-free alloys.

Abbreviations used:

RAl	high-purity aluminium (Al99,98R)
RT	room temperature
m.pt.	melting point
v.pt.	vapour point
b.pt.	boiling point
G-Alxx	casting alloy
aq.	aqueous
sol.	solution
dil.	diluted
conc.	concentrated

Explanation of symbols used in table:

+	practically corrosion resistant
(+)	fairly corrosion resistant
(-)	not particularly corrosion resistant
-	unusable for reasons of chemical corrosion, thermal resistance or mechanical properties

The data given generally apply to unalloyed aluminium and copper-free aluminium alloys.

The table has been compiled on the basis of relevant sources that represent the state of the art. It is not exhaustive. The information in this table is provided without guarantee and represents recommendations only.

The information is intended primarily as suggestions for users, indicating which materials are basically suitable for a planned application, suitable under certain conditions, or unsuitable due to certain factors. The table does not take into account the precise material composition of the products, varying operating conditions or other operational conditions.

We reserve the right to make technical modifications and correct typographical errors.

Substance	Behaviour	Comments
A		
Abietic acid	+	Al up to 300°C, AlSi alloy up to 180°C: +; 1% H_2O beneficial
Acenaphtene	+	RT; 10% benzol solution
Acetaldehyde	+	RT, Cu-free alloys
Acetamide	+	RT, Cu-free alloys
Acetanilide, Antifebrin	+	up to 115°C
Acetic acid, glacial acetic acid	+...-	RT: +; v.pt.: -
Acetic anhydride	+...-	RT, Cu-free alloys: +; > v.pt.: (+)...-
Acetic isoamyl ester, isoamyl acetate	+	
Acetoacetic ethyl ester	+	up to v.pt.: +
Acetoacetic methyl ester	+	up to v.pt.: +
Acetone	+	up to v.pt.: +
Acetone chloroform	(+)...-	RT, 10 to 50 % alc. sol.: pitting
Acetone dicarboxylic acid	+...(+)	RT
Acetonitrile	+...(+)	RT: light pitting; neutral to acetone
Acetophenetidine	+	
Acetophenone	+	up to v.pt.: +
Acetotoluide, p-acetotoluide	+	
Acetyl chloride	-	
Acetylacetone	+	up to v.pt.: +
Acetylene cellulose	+	

Substance	Behaviour	Comments
Acetylene dichloride	+	up to v.pt.: +
Acetylene, dissolved acetylene	+...(+)	dry: +; moist: (+); AlCuMg alloys: (+)
Acetylsalicylic acid, Aspirin	+	
Aconitic acid	+...(+)	RT: +; v.pt.: (+)
Acridine	+	
Acrolein	+	
Acrylic acid, Propene acid	+	
Acrylonitrile	+	
Adipic acid	+	
Agar-agar	+	
Albumen	+	
Alizarin	+	
Alkaline melts	-	
Alkaloids	+	
Alkyd resins	+	
Allyl alcohol, propenol	+...(-)	with inhibitors (sodium water glass and sodium lactate): +; anodised: +; impure: (+)...(-)
Allyl bromide	+...-	100% sol.: +; alcoholic sol.: -
Allyl chloride	+...(-)	neutral, H_2O-free: +; H_2O-containing: (-)
Allyl sulphide	+	
Allylamine	(+)...-	corrosion comes to a halt; >RT: -; Cl ions: -
Aloe	+	no discolouration of product
Alum solution	+...-	5% H_2O sol., RT: +; 10% H_2O sol., RT: (+); >RT: -
Alumina cement	+...(-)	dry: +; moist: (+)...(-)
Aluminium acetate	+...(+)	RT: +; v.pt.: (+); 2% H_2O sol., acidic: (+)
Aluminium chloride	+...-	in absence of iron chloride: +; moist: -
Aluminium fluoride	+...(-)	solid, also moist: +; aq. sol.: (-)
Aluminium fluorosilicate, aq. Sol.	-	
Aluminium formiate	+...(+)	10% sol., RT: +; >10% up to 80°C: (+)
Aluminium lactate	+	RT, 50% sol., light pitting
Aluminium nitrate	+...(-)	solid: +; aq. sol., RT: (+); 100°C: (-)
Aluminium oxide-hydroxide	+	
Aluminium palmitate	+	Al99.5, AlMg3, AlMgMn, RT, 10% benzol sol.
Aluminium phosphate	+	RT, Al99.5, AlMg3, AlMgMn
Aluminium sulphate	+...(-)	solid: +; aq. sol.: (-)
Amino acid mixtures	+	Cu-free alloys
Aminoplaste	+	
Ammonia, gaseous or liquid	+...(+)	dry A. up to 600°C: +; liq. A., dry: +; moist A.: (+)
Ammonium acetate	+	<70°C
Ammonium azide	+	Cu-free alloys
Ammonium benzoate	+	10, 50 and 100% H_2O sol.; RT
Ammonium bifluoride solution	-	
Ammonium bisulphide	+...(+)	aq. sol.
Ammonium bromide	(+)...-	Al better than Al alloys; v.pt.: -; anodising beneficial
Ammonium carbamate	+	Al- and Cu-free alloys up to 125°C

Substance	Behaviour	Comments
Ammonium carbonate	+...(+)	solid: +; Cu-free alloys: +; aq. sol.: (+)
Ammonium chloride	(+)...(-)	Al, G-AlSi, G-AlMg in dil. sol. up to 100°C: (+); conc. sol. >100°C: (-)
Ammonium chromate	+	
Ammonium citrate	+...(+)	Cu-free alloys, RT: +; >50°C: (+)
Ammonium fluoride	+...-	solid, Al, AlMg, AlMn, AlMgMn, G-AlMg: +; AF in sol., RT: (-); >RT: (+)...-
Ammonium fluosilicate	+	data only for Al
Ammonium formate	+...-	Al; AlMg; AlMn; AlMgMn; G-AlMg; 100°C; 10% sol.
Ammonium hydroxide	(+)...(-)	RAl, AlMg, AlMgMn better than Al, AlMgSi, AlSi; max. attack in 8-10% NH4OH: (-)
Ammonium lactate	(+)...(-)	RT: (+); v.pt.: -
Ammonium molybdate	+...(-)	solid: +; aq. sol.: (+)...(-)
Ammonium nitrate	+	AlMn, AlMg3, AlMgSi, G-AlSi, G-AlMgMn; no effect of catalyst
Ammonium nitrite	+	
Ammonium oxalate	+...(-)	solid: +; aq. sol., RT: +; >RT: (+)
Ammonium perchlorate	(+)	neutral; up to 85°C
Ammonium persulphate solution	(-)	
Ammonium phosphate solution, aq.	(+)...-	NH_4HPO_4: (-)...-; $(NH_4)_2$ HPO_4 (3% H_2O sol.), >20°C: (+); $(NH_4)_3HPO_4$: (+)...(-)
Ammonium picrate	+	20°C; applies only for Al
Ammonium rhodanide	+	Cu-free alloys, <100°C
Ammonium sulphaminate	+...(-)	solid: +; aq. sol., RT: (+); >RT: (-)
Ammonium sulphate	+...(-)	solid: +; aq. sol., RT: (+); >RT: (+)...(-)
Ammonium sulphide, polysulphide	+...(+)	aq. sol., RT: +; >RT: (+)
Ammonium sulphite solution aq.	(+)...(-)	AlMg: (+)...(-); G-AlMg: (+)...(-)
Ammonium thioglycolate	+	
Ammonium thiosulphate, polythionate	+	Cu-free alloys
Amyl acetate	+	Cu-free alloys
Amyl alcohols	+...(-)	RT: +; >130°C: (+)...(-)
Amyl amines	+...(+)	Al, AlMg, RT: +; impure: (+)
Amyl butyrates	+	
Amyl chloride	+...(-)	RT: +: moist AC: (-)...-
Amyl methyl ketone	+	RT
Amyl nitrate	+	Cu-free alloys
Amyl nitrite	+	
Amyl phenol	+	
Amyl propionate	+	Cu-free alloys: only for acid-free AP
Aniline	+...-	RT: +; v.pt.: -
Aniline chloride	-	
Aniline sulphate	(+)...-	RT: (+): >50°C: -
Aniline sulphite	(+)...(-)	Al, neutral: (+); alkaline, acidic: (-)
Aniseed oil	+	
Anisic alcohol	+	
Anthracene	+	
Anthracene oil	+	
Anthranilic acid	(+)	
Anthraquinone	+	

Substance	Behaviour	Comments
Antifebrin, Acetanilide	+	up to 115°C
Antimony pentachloride	+...-	<70°C: +
Antimony sulphate solution	-	
Antimony trichloride	+...-	H_2O-free: +; moist: -
Antipyrine	+	
Apple juice, apple purèe	+...-	RT: +; >70°C: (+)...(-); v.pt.: -
Apple syrup	+	
Aqua regia	-	
Arabic acid	(+)	
Arachidic acid	+...(-)	Cu-free alloys; <100°C: +; 100-300°C (-); 100-300°C with 1% H_2O: +
Arsenic acid	(+)...(-)	
Arsenic monosulphide	+	up to 20°C
Arsenic pentoxide	-	
Arsenic trichloride	+...-	RT, H_2O-free: +; H_2O-containing: -; >40°C: -
Arsenic trioxide	+	
Arsenous acid	+	up to 20°C
Ascorbic acid	(+)...(-)	
Aspartic acid	+	
Asphalt	+	m.pt.: +
Aspirin, acetylsalicylic acid	+	
Atmosphere	+...(+)	
Atropine	+	
Aurates	-	corrosion by leaching in presence of electrolytes
Azo benzene	+	
p-aminosalicylic acid	+	
B		
Baking powder	+	
Balata	+	
Barium acetate	+...(-)	at b.pt.: (-)
Barium carbonate	+...(+)	solid: +; aq. sol.: (+)
Barium chlorate	+	
Barium chloride	+...-	solid: +; aq. sol., RT: (+); >RT: (-); alkaline sol.: (-)...-
Barium hydroxide	(+)...-	>RT: -
Barium nitrate	+	
Barium phosphate solutions	(+)...-	neutral sol.: (+); acid sol.: -
Barium sulphate	+	
Barium sulphide or polysulphide sol.	-	
Bauxite	+	
Beer	+	
Beeswax	+	
Benzaldehyde	+...-	H_2O sol.: -; H_2O-free: +
Benzamide	+	128°C
Benzene	+	

Substance	Behaviour	Comments
Benzenesulphonic acid	(+)...-	Cu-free alloy, RT: +; >RT: (-)...-
Benzidine	+	applies only to Al (refined)
Benzil	+	150°C; applies only to Al (refined)
Benzilic acid	+...-	<50°C, H_2O sol.: +; >50°C, increasing conc.: (-)
Benzine, petroleum ether	+	pure, neutral
Benzofuran, coumarone resin	+	
Benzoic acid	+...-	<100°C: +; H_2O-free BA, 50°C: -; AlSi, <60°C: +
Benzoic acid anhydride	+	
Benzoin	+	applies only to Al
Benzol	+...(-)	H_2O-free: +; H_2O-containing: (+)...(-)
Benzonitrile	+	
Benzophenone	+	neutral
Benzoquinone, 1,4 benzoquinone	+	Al
Benzotrichloride	+...-	RT, H_2O-free: +; >RT, H_2O-containing: -
Benzyl acetate	+	20°C; applies only for Al
Benzyl alcohol	+	Al, G-AlSi, G-AlMg, RT
Benzyl benzoate	+	20°C; applies only to Al
Benzyl butyl phthalate	+...-	RT: +; >RT: -
Benzyl chloride	+...-	RT, H_2O-free: +; >RT, H_2O-containing: -
Benzyl ethyl aniline	+	20°C
Benzyl phenol	+...-	Cu-free alloys, RT: +; >RT: (+)...-
Benzylamine	-	
Benzylsulphanilic acid	+	
Bergamot oil	+	
Bergaptol	+...(+)	RT: +
Beryllium chloride	+...(-)	H_2O-free: +; aq. sol., RT: (+); >RT: (+)...(-)
Beryllium sulphate	+...(+)	Cu-free alloys, neutral BS: +
Birch extract	+	
Bitumen	+	
Black currant juice	(+)...-	
Bleach and hair removal cream	-	
Blood	+	
Boric acid	+...(-)	RT, 5% BA: +; >RT and increasing conc.: (+)...(-); refined Al better than Al
Borneol, Borneo camphor	+	
Borofluoric acid	(-)	
Boron	+	Al; <500°C: +
Boron phosphate	+...-	RT, also moist: +; 320°C: -
Boron trichloride	-	
Bouillie Bordelaise “Bordelaiser Brühe”	+...(+)	anodised, chemical conversion coated: +
Brackish water	(+)...(-)	Al99.5, AlMn, AlMg3, AlMgMn better than AlMgSi, AlCuMg
Brandy	(+)...(-)	Al with an anodically produced oxide layer: (+)
Bromic acid	-	
Bromine	+...-	dry B: +; H_2O-containing B: -
Bromobenzene	+	at RT

Substance	Behaviour	Comments
Bromoform	+...-	RT, anodised: +
Butadiene, 1,3-butadiene	+	RT
Butane	+	gaseous butane
Butanoic acids, butyric acids	+...(-)	Cu-free alloys; <30°C: +; >30°C: (+)...-
Butter	+	Cu-free alloys
Buttermilk	+...(-)	depending on degree of acidity
Butyl acetate	+	Cu-free alloys, RT; anodise with weakly acidic BA
Butyl alcohols	+...-	Cu-free alloys; < v.pt., 0.5% H_2O: +; v.pt.: (+)...-
Butyl benzoate	+	
Butyl butyrate	+...-	RT, acid-free: +; >RT, H_2O or acid containing: -
Butyl chlorides	+...-	Cu-free alloys, RT, dry, neutral: +; moist, acidic BC: -
n-butyl glycol	+	
Butyl oxalate	+	
Butyl phenole, tert.	+...-	with small H_2O content up to 150°C: +; H_2O-free, 150°C: -
Butyl phthalate	+...-	Al99.5; neutral BP, <100°C: +; acidic BP: -
Butyl urethane	+	
Butylamines	+...-	Al99.5, RT, 0.05% H_2O: +; >RT: (+)...-
Butylene	+	
Butyric acids, butanoic acids	+...(-)	Cu-free alloys; <30°C: +; >30°C: (+)...(-)
C		
Cacao	+	
Cadmium chloride	(-)...-	dil. aq. sol., RT: (-);sol. of higher conc., >RT: -
Cadmium melt	+	
Cadmium sulphate	+...-	30% CdSO4 sol., <50°C: +; >75°C: -
Caesium hydroxide	-	
Caffeine	+	
Calcium acetate	+...-	Al; G-AlSi; neutral CA sol., 20°C: +; neutral CA sol., 100°C: (+); CA sol. with $Ca(OH)_2$: -
Calcium bicarbonate	+	
Calcium bisulphide	(+)	
Calcium bisulphite	(+)...-	Cu-free alloys; CB with acid digestion: -
Calcium bromide	(+)...-	RT: (+); >RT: (-)...-
Calcium carbide	+	unalloyed aluminium
Calcium carbonate	+	
Calcium chlorate	+	chloride-free sol.
Calcium chloride	+...(-)	solid and dry: +; Cu-free alloys, solution : (-)
Calcium chromate	+	
Calcium fluoride	+	data only for unalloyed aluminium
Calcium hydride	+	data only for unalloyed aluminium
Calcium hydroxide, slaked lime	(-)...-	RT: (-); >RT: (-)...-
Calcium hypochlorite solution, chlorinated lime solution	+...-	1% sol.: +: conc. sol.: -
Calcium nitrate	+	
Calcium oxalate	+...-	RT, H_2O-free: +; >RT, moist: (-)...-
Calcium peroxide	+...(-)	slurry of CP in H_2O: (-)

Substance	Behaviour	Comments
Calcium phosphate	+...-	acidic CP sol.: -; tricalcium phosphate: +
Calcium propionate	+	
Calcium rhodanide	+	Cu-free alloys
Calcium silicate	+	
Calcium sulfaminate	+	
Calcium sulphate	+...(-)	Cu-free alloys, dry: +, conc. aq. sol., RT: (+); dil. aq. sol.: (-); anodising beneficial (risk of pitting)
Calcium sulphide	+...(+)	up to 20% aq. sol. RT: +; >20%: (+)
Calcium sulphite	+	data only for unalloyed Al and AlMg alloys
Camphene	+	
Camphor	+	Cu-free alloys
Capric acid, n-capric acid	+	air, H_2O-containing (>0.1%): +
Caproic acid	+	min. H_2O content 0.05% : +
Caprolactam, ε-caprolactam	+	discoloration possible
Caprylic acid	+	>100°C, min. H_2O content 0.1%: +
Caprylic alcohol, sec.	+...-	min. H_2O content 0.01%, air: +; AlSi better than Al
Capsaicine	+	
Carbazole	+	
Carbitol	+	>100°C, min. H_2O content 0.02%: +
Carbolineum	+	<100°C
Carbon dioxide, carbonic acid	+	38°C: +
Carbon disulphide	+	up to b.pt.
Carbonic oxide, carbon monoxide	+	
Carbon tetrachloride	+...-	RT: +; >50°C: (+)...-
Carnallite	+...-	dry: +; moist: -; anodised: +
Carotene	+	
Casein	+	
Castor oil	+	≤100°C
Catechu	+	
Celluloid	+	
Cellulose	+	
Cellulose ether	+	neutral, solid: +; alkaline sol.: -
Cellulose nitrate	+...(+)	
Cellulose paints	+	
Cellulose tripropionate	+	
Ceresin	+	
Cerfluoride und cerite fluoride	+	data only for unalloyed aluminium
Ceryl alcohol	+	
Cements	+...-	not set: -; dry: +
Chaulmoogric acid	+	>180°C, min. H_2O content 0.05% : +
Cheese	+...(-)	AlCu alloys: negative effect on taste
Chlorine	+...-	H_2O-free, <134°C: +; H_2O-free, 177°C: -; moist: -
Cinnabar, mercury sulphide	-	(with ingress of moisture)
Cinnamic acid, aqueous solution	+	RT
Coffee	+	

Substance	Behaviour	Comments
Condensed milk	+	
Colophony	+	<280°C
Copal resin	+	
Copper acetate	-	oxidation of acetaldehyde with oxygen and Cu in Al: +
Copper carbonate	+...-	RT, ammoniac sol.: +; neutral CC with H_2O, anodised: +; alkaline CC: -
Copper chloride	-	
Copper oxide	-	
Copper sulphate	-	basic CS, anodised Al: +...(+)
Copper tetramine compounds	+...-	ammoniac CTC sol.: +; CTC sol. without free ammoniac: -
Corn	+...(-)	Al with anodically produced oxide layer: (+)
Creosote	+	<100°C
Chloral hydrate, chloral, trichloroacetaldehyde	-	
Chloramine	+...(-)	alkaline: (-); neutral, 0.5% C. sol.: +
Chloramine benzoic acids	+	
Chloranilines	+...-	RT: +: v.pt.: -
Chlorobenzene	+	
Chlordane	+...(+)	H_2O-emulsions: (+)
Chlorinated lime solution, calcium hypochlorite solution	+...-	1% sol.: +: conc. sol.: -
Chloroformates	+...-	H_2O-free RT: +: moist: -
Chloroacetyl chloride	-	
Chloroacetic acid	(+)...-	only solid and dry: (+); moist: -
Chloronaphthalenes	+...-	RT: +; >RT: (+)... -
Chloronitrobenzoic acids	(+)...-	RT: (+); >RT: (-)...-
Chloronitrobenzene	+	
Chloroform	+...-	H_2O-free: +; moist: (-)...-
Chlorophyll	+	
Chloropren	+	
Chlorophenole	+...-	RT: +; >RT, H_2O-free: (-)...-
Chloric acid	-	
Chlorsulfuric acid	+...-	<75°C, H_2O-free: +; moist: (-)...-
Chlorine water	-	
Chloroxylole	+	data only for unalloyed aluminium
Chocolate	+	
Cholesterol	+	
Chrome alum solution	(+)...-	<10% sol., RT: (+); >50°C: (-)...-
Chromium chloride solution	-	
Chromium nitrate	(+)...(-)	sol. up to 10%: (+); >10% : (-)
Chromium oxide, chromium hydroxide	+	
Chromium phosphate	+...(+)	alcoholic acidic sol.: (+)
Chromic acid	(+)...-	<10%, RT: (+); >10%, >RT: (-)...-
Chromium sulphate solution	(+)...(-)	<10%, RT: (+); >10%, >RT: (-)
Chromium trioxide	+	H_2O-free
Citric acid	+...(-)	Cu-free alloys: +; refined Al better than Al
Citric acid solution	(+)...(-)	RT: (+); 50°C: (+)...(-); 98°C: (-)

Substance	Behaviour	Comments
Citrus fruit juice	(+)...(-)	RT: (+); RT: (-)
Citrus oils	+	
Clay	+...(+)	moist: (+); dry: +
Cocaine	+	
Codeine	+	RT, chloride-free solution: +
Codeine salts	+...-	chloride: -; phosphate: +; sulphate, RT, neutral: +
Cod-liver oil	+	
Collagen	+	
Coniferyl alcohol	+	
Concrete	+...-	not set: -; dry: +
Crotonaldehyde	+...(+)	
Cottonseed oil	+	
Coumarin	+...(+)	
Cream ice-cream	+	
Cresols	+...-	<100°C: +; v.pt., dry vapour: -; v.pt., humid vapour: +; >120°C, H_2O-free: -; >120°C, 0.3% H_2O: +
Coumarone resin, benzofuran	+	
Currant juice, black	+...(-)	
Cutting oils, drilling oils, oils etc.	+	
Cyanogen chloride	+	RT
Cyclohexane and its homologous	+	
Cyclohexanol aminocarbonate	+	
Cyclohexene	+	
p-cymene	+	
Cystine and cysteine	+	
D		
DDD, dichlorodiphenyl-dichloroethane	+...-	H_2O-containing, RT: (+); >RT: -; organic sol., >100°C: +
DDT and DFDT	+	
Decaline, decahydronaphtalene	+	also at b.pt.: +
Deuterium oxide	+...(-)	RT: +; Al
Dextran	+	
Dextrine	+...-	RT: +; >RT: (+)...- (anodising beneficial)
Dextrose	+	
Dialkyl sulphate	+	> 100°C, H_2O-free, Cu-free alloys: +
Diazo compounds	+...-	pure azo colouring agents: +; acidic diazo compounds: -
Dibutyl thiocarbamide	+...-	RT: +; >RT: (+)...-
Dichlorethylene	+...-	<60°C, H_2O-free: +; H_2O-containing: (-)...-
Dichlormethane, methylene chloride	+...(-)	Al99.5, RT: +; AlMg alloys: (+); AlCu alloys: (-); >RT, moist: -
Dichlorodifluoromethane, Freon	+...-	dry: +; moist: +...(-); with H_2O: -
Diethanolamine	+	
Diethyl aniline	+...-	RT: +; H_2O-free, >RT: -
Diethyl thiophosphoric acid-p-nitrophenylester, E 605	+	
Diethylamine	(+)...(-)	Al; RT: (+); v.pt.: (+)...(-) (corrosion rate decreases)
Diethylaniline, dimethylaniline	+...-	RT: +; H_2O-free D., v.pt.: -

Substance	Behaviour	Comments
Diethylene glycol	+	
Diglycolic acid	+...-	RT: +...(+); Al better than alloys; >40°C: (-)...-
Dihexylketone	+	RT
Di-isobutyl	+	
Dimethylaniline, diethylaniline	+...-	RT: +; H_2O-free D., v.pt.: -
Dimethylformamide, DMF	+	
Dioxan	+...-	Cu-free alloys, non-acidic D.; < v.pt.: +; <0.05% H_2O, v.pt.: -
Diphenylamine	+...-	<70°C: +; v.pt.: -
DMDT, Dimethoxydiphenyltrichloroethane	+...(-)	H_2O-free: +; with H_2O: (+)...(-)
Drilling oils, cutting oils, oils etc.	+	
Dynamite	+	
E		
Eggs, dried egg, egg dishes	+	
Ethane	+	if ethane moist and impure, only with lacquer coating: +
Ethanolamine	+	RT
Ethine	+	
Ethyl acetate	+	up to v.pt. (77°C): +
Ethyl alcohol	+	
Ethyl amine	+	RT
Ethyl bromide	+...-	RT; 10% alcohol sol.: - (pitting)
Ethyl chloride	+...-	EC with H_2O: -; Al99.5, AlSi, RT: +
Ethyl ether	+	34.6°C; Transformation of alcohol to EE + H_2O (210°C) in Al equipment: +
Ethyl formiate	(+)...(-)	RT; neutral EF: (+); >RT, acidic EF: (-); anodising is beneficial
Ethyl glycol	+	up to 170°C
Ethyl oleate	+	RT
Ethyl stearate	+	
Ethylene	+	corrosion by impurities, thus protective measures required with moist E
Ethylene bromide	+...-	RT; H_2O-free EB at 132°C: -; at 20°C: +
Ethylene carbamide	+	valid for unalloyed aluminium
Ethylene chloride	+...-	H_2O-containing EC: -; H_2O-free EC <84°C: +
Ethylene imine	(+)...(-)	RT; unalloyed aluminium: (+); v.pt.: (-)
Ethylene mercaptan	+	usual 10% solution
Ethylene oxide	+	
Ethylene trichloride	+...(-)	pure, H_2O-free solvent: +; moist (+)...(-)
Ethylsulphuric acid	(+)...-	H_2O-free: (+)
F		
Fats and waxes	+	Cu-free alloys
Fatty alcohols	+...-	Cu-free alloys, >RT: +; RT to v.pt., H_2O-free: (+)...- ; anodising beneficial
Ferric chloride	-	
Ferric sulphate	-	
Ferrous chloride	-	
Ferrous sulphate	+...-	RT, undeaerated: +; ingress of air, 100°C: -
Floor wax	+	

Substance	Behaviour	Comments
Fluorine	+...-	Cu-free alloys: +; H_2O-free, <450°C: +; moist: -
Fluorocarbonic acids, fluorocarbonic halogenides	-	
Fluorocarbons, flourohydrocarbons F11 etc.	+	RT, H_2O-free: +
Formaldehyde, formalin	+...-	Formic acid free: +; F with formic acid: -
Formamide	+	
Formic acid	(+)...-	RT, <1% and >95% sol.: (+); 1-95% sol.: (-); >RT: (-)...-
Freon, dichlorodifluoromethane	+...-	dry: +; moist: +...(-); with H_2O: -
Fulminate of mercury, mercury fulminate	-	
Furfular	+	not fully H_2O-free, Cu-free alloys
G		
Gallic acid	+	
Gin	(+)...(-)	negative effect on taste
Gluconic acid	+	anodising beneficial
Glucose, dextrose, aq. sol.	+	
Glutamic acid	+...(-)	RT, dil. sol.: +; >RT, increasing conc.: (+)...(-)
Glycerin	+	G containing NaCl: -
Glycol aldehyde	+	RT
Glycol, diethylene glycol	+	copper-free Al: +
Gum	+	
Gutta-percha	+	
Gypsum, calcium sulphate	+...(-)	Cu-free alloys, dry: +; moist, possible pitting; anodising beneficial
H		
Ham	+	
Heating oil	+	H. with NaCl sol.: +; ingress of light: (-)
Hexachlorobenzene, perchlorobenzene	+	
Hexachloroethane, perchloroethane	+...-	RT: +; >RT: (+)...-
Hexamethylenetetramine, urotropine	+	
Hexamine	+	
High-alumina cement, alumina cement	+...(-)	dry: +; moist: (+)...(-)
Honey	+...(+)	
Humic acids	+	
Hydrazine, hydrazine salts	+...-	H.: +; Hydrazine hydrochloride: -
Hydrobromic acid	-	
Hydrocyanic acid, prussic acid	+	Cu-free alloys
Hydrogen	+	
Hydrogen chloride, hydrochloric acid	-	
Hydrogen fluoride, hydrofluoric acid	-	
Hydrogen iodide	+...(-)	H_2O- and air-free, 25°C: +; moist: (-)
Hydrogen peroxide	+...(+)	
Hydrogen sulphide	+...(+)	
Hydroquinone	+	Cu-free alloys: +; Metol/H-developer: +...- (AlMg < RAl < Al99.5)
Hypochlorous acid	-	

Substance	Behaviour	Comments
I		
Ice	+	
Ice-cream	+	
Indole	+	Cu-free alloys
Ink, ferro-gallic ink	+	ink affected by Al
Iodine	+...-	solid, H_2O-free: +; moist: (+)...-
Iodoform	+...(-)	Cu-free alloys, RT, H_2O-free: +; moist: (-)
Iron oxide, rust, hydrated	+...(+)	on Al surface promotes corrosion of Al
Iron sulphide	+...(-)	dry: +; in presence of H_2O: (+)...(-)
Iron-II-chloride, Ferrous chloride	-	
Iron-III-chloride, Ferric-chloride	-	
Iron-II-sulphate	+...-	RT, unventilated: +; in presence of H_2O, 100°C: -
Iron-III-sulphate	-	
Isatin, isatin derivatives	+	Cu-free alloy
Isoamyl acetate, acetic isoamyl ester	+	
Isobutane	+	
Isobutyl alcohol, primary	+...-	RT: +; v.pt.: -
Isobutyl phosphate	+...-	RT, neutral, Cl-free: +; >RT, H_2O-containing: -
Isobutyric acid	+	
J		
Jams, marmelades	+...(+)	
Joiner'sglue	+	
K		
Kerosene, Vaseline	+	< v.pt.
L		
Lacquers	+	
Lactic acid	+...(-)	Cu-free alloys, RT: +...(+); >RT, H_2O-free: (-)
Lactose	+	
Lard	+...-	salt-free: +; salt-containing: (+)...-
Latex, Rubber	+	
Lauric acid	+...(+)	
Lead	+	m.pt.: +
Lead acetate	(-)...-	Cu-free alloys: (+); RT, dil. sol. (+); >RT: -, dry LA: +
Lead arsenate	+...(-)	moist LA: (-); anodised and lacquered: +
Lead azide	+	
Lead bromide	(+)...-	
Lead carbonat, white lead	+	for dry LC: +
Lead nitrate solution	-	
Lead oxide	+	dry: +
Lead sulphate	+...-	dry: +; moist: -
Lead tetraethyl	+...(-)	dry: +; LT also in fuels: +; with H_2O (-); moist: +...(-)
Lecithin	+	Cu-free alloys

Substance	Behaviour	Comments
Lemonades	+...(+)	
Levulinic acid	+...-	Al alloys: (-)...-; RT, RAl: +; >RT: (+)...-
Lignite tar	(+)...-	RT, H_2O-containing : (+); >150°C, H_2O-free: -
Linseed oil	+	<250°C
Liqueurs	+...(-)	with anodically produced oxide layer, compacted: +
Lithium carbonate	(+)...-	no data for alloys; RT: (+)...(-); 630°C: -
Lithium chloride	(+)...(-)	RAl: (-)
Lithium hydroxide	-	
Lubricating oils	+	
Lysol, aq. sol. <5%	+...(+)	RT: +; 70°C: (+)
M		
"Maggiwürze" (sauce)	+...(-)	with MBV layer or anodically produced oxide layer: +
Magnesium	+	Mg powder
Magnesium bisulphite	(+)...-	>RT: (+)...-
Magnesium carbonate	(+)	AlMg alloys: +...(+)
Magnesium chloride	+...(-)	RT, Cu-free alloys: +...(+); anodised: +
Magnesium fluoride	+	
Magnesium nitrate	+...(+)	Al99.5; 10% sol., RT: +; v.pt., neutral sol., Al99.5: +...(+)
Magnesium oxide, magnesium hydroxide	+...(-)	
Magnesium oxychloride	-	
Magnesium silicofluoride	+	
Magnesium sulphate	+	
Magnesium sulphite	+...(+)	RT: +; 50°C: (+); v.pt.: +...(+)
Maleic acid	+...(-)	RT, Cu-free alloys: +; 100°C: (-)
Malic acid	(+)...(-)	AlMg, AlMn, AlMgSi, G-AlMg, G-AlMgSi: (+)...(-); AlMgMn, G-AlSi: (+); >RT: (+)
Malonic acid	+...(-)	RT, 5% sol., Al: +; >RT, increasing conc.: (+)... (-)
Malt	+	
Maltose	+	
Manganese carbonate	+	
Manganese dioxide	+	<500°C: +
Manganese sulphate	+...(-)	RT, Cu-free alloys: +; 100°C: (+)...(-)
Mannitol	+	
Margarine	+	
Meat	+	
Marmalades, jams	+...(+)	
Menthol	+	
Menthylformate	+	
Mercury	+...-	dry: +; vapour(150-170°C), vacuum: (+)...(-); moist: -
Mercury chloride, sublimate	-	
Mercury fulminate, fulminate of mercury	-	
Mercury sulphide, cinnabar	-	(with ingress of moisture)
Mersols, mersol sulphonic acids, mersol soaps	+...-	RT, Cu-free alloys: +; alkaline, acidic M: -
Methane	+	

Substance	Behaviour	Comments
Methanol, Methyl alcohol	+...-	Cu-free alloys, RT: +; >RT: (+)...-
Methyl acetate	+...-	Cu-free alloys, acid-free MA: + H_2O-free MA, with methanol, >RT: -
Methyl bromide	(+)...(-)	dry MB: (+); moist MB: (+)
Methyl chloride	(+)...-	
Methyl ether	+	
Methyl formate	+	Al99.5, AlMg3, AlMgMn, RT
Methyl methacrylate	+	
Methylamine	+...(+)	RT, >0,2% H_2O: +...(+) (anodising beneficial)
Methylene chloride, dichlormethane	+...(-)	Al99.5, RT: +; AlMg alloys: (+); AlCu alloys: (-); >RT, moist: -
Mikroformine, aq. sol. 1%	+	<50°C: +
Milk	+	
Mineral water	+...(+)	depending on water analysis
Molasses, vinasses	+	
Monoethanolamine	+	RT, pure cond.
Monoperacetate, acetaldehyde, peracetic acid	+...(-)	unalloyed Al
Monosodium glutamate	+...-	acidic MG sol.: +; alkaline MG sol.: -
Morphine	+	
Morpholine	+	
Mortar, wet	-	
Mushrooms	+	
Mustard	+...(-)	with air ingress: (-); with air excluded: +
Musts	(+)...(-)	with lacquering: +; with wax or paraffin film: +
N		
Naphtalene	+	Cu-free alloys: +
Naphtalene sulphonic acids	+...-	RT: +; >RT: (+)...-
Naphthenic acids	+	Cu-free alloys: +
Naphthols	+...-	RT: +; H_2O-containing, 100°C: +; H_2O-free (<0,05%), >RT: -
Neomoscan	(+)...-	solid, moist: -, H_2O-sol.: (+)
Nickel acetate solution	-	
Nickel nitrate solution	-	
Nickel II chloride	-	
Nickel salt solutions, blue salt solutions	-	
Nickel sulphate solution	-	
Nickelous chloride solution	-	
Nicotine, nicotine sulphate	+	Cu-free solutions: +
Nicotinic acids	+	Cu-free solutions: +
Nitric acid	+...-	RT, high conc. +, decreasing conc. and higher temps: (+)...-
Nitric ester	(+)	
Nitro-anilines, nitraniline	+	
Nitrobenzoene	+	
Nitrobenzoic acids	+	Cu-free alloys: +
Nitrocellulose	+...(-)	stabilised: +, non-stabilised: (-)
Nitroethane	+	

Substance	Behaviour	Comments
Nitrogen	+	
Nitrogen oxides	+	
Nitroglycerin, nitroglycol	+	Cu-free alloys: +
Nitromethane	+	
Nitrophenols	+...(-)	Cu-free alloys: +; H_2O-free: +; moist: (-)
Nitrosulphuric acid	-	
Nitrosyl chlorid	-	
Nitrosyl fluorid	(+)...(-)	no data for alloys
Nitrotoluenes, mono-, dinitro-	+	Cu-free alloys: +
Nitrous acid	(+)...(-)	also at elevated temperature, only slight attack
Nonyl alcohol, n-nonyl alcohol	+	
Novocaine	+	
Nylon, Nylonsalt	+	Cu-free alloys: +
O		
Oak bark extract	+...-	35°C: +; sulphite addition, >RT: -
Oils, Drilling oils, cutting oils, etc.	+	
Oleic acid	+...-	up to v.pt.: +; v.pt., H_2O-free: -
Oleum, sulphur trioxide	+...-	H_2O-free: +
Olive oil	+	Cu-free alloys: +
Orange juice	+...(-)	RT: +; >RT: (+)...(-)
Oxalic acid	+...-	RT: +...(+); >RT: (+)...-; increasing conc.: (+)...-
Oxalic ethyl ester	+	up to b.pt.
Oxygen	+	
Ozone	+...(-)	dry: +; moist: (+)...(-)
P		
Palm nut oil, palmin	+...-	v.pt., H_2O-free: -
Palmitic acid	+...-	< v.pt.: +; v.pt., only completely H_2O-free PA: -
Paraffin	+	
Paraformaldehyde, trioxymethylene	+	
Paraldehyde	+	RT
Pastries	+	
Peanut butter	+	
Pectin	+	
Penicillin	+	
Peracetic acid, acetaldehyde monoperacetate	+...(-)	unalloyed Al
Perchlorethylene	+	up to b.pt.: +
Perchloric acid	-	
Perchlorobenzene, hexachlorobenzene	+	
Perchloroethane, hexachloroethane	+...-	RT: +; >RT: (+)...-
Petroleum ether, benzine	+	pure, neutral
Petroleum, Vaseline	+	<v.pt.
Phenol	+...-	0,3% H_2O: +; H_2O-free, >60°C: -
Phenolic plastics	+	

Substance	Behaviour	Comments
Phenylaminoacetic acid, phenylglycine	+	
Phosgene	+...-	H_2O-free, liq., no light: +, moist P: -
Phosphoric acid	(+)...-	only very dilute PA: (+)
Phosphoroflouric acid	+	H_2O-free
Phosphorus	+...-	RT: +; >RT: -
Phosphorus chloride	+...-	RT, dry: +...(+); >RT or moist: -
Phosphorus pentoxide	+...-	unalloyed Al; H_2O-free, <100°C: +; PP with H_2O: -
Phosphorus sulphide	+...-	Al: >10%: -; <2% H_2O, RT: +
Phthalic acid, phthalic acid anhydride	+...(+)	
Picric acid	+	up to m.pt.: +
Picric acid, trinitrophenol	+	
Platicine	+...(+)	
Polyethylene	+	
Polystyrenes	+	
Polyvinyl alcohol	+	
Polyvinyl butyral	+	
Polyvinyl chloride	+	
Porous concrete	+	
Potassium bitartrate, tartar	+	
Potassium chromate	+	
Potassium hypochlorite	-	1% PHC sol. with 5x amount of alkaline silicate: (+)
Potassium monochromate	+	
Potassium nitrite	+...(+)	100°C: (+); anodised, 100°C: +
Potassium oxalate	+...(+)	dry: +; H_2O-sol.: (+)
Potassium sulphate	(+)...(-)	RT: (+); >RT: (-)
Potassium acetate	+...-	>60°C: -; RT, 10% sol.: +
Potassium bisulphite	+...-	RT, 10% sol.: +; >RT: (+)...-
Potassium bromide	+...-	RT, 5% sol.: +; increasing conc., increasing temp.: (+)...-
Potassium carbonate, potash	-	RT, 5-53% sol.: -; with sodium water glass addn.: (-)...+
Potassium chlorate	+	
Potassium chloride	(+)...(-)	Al and AlMg alloys better than AlCu alloys
Potassium cyanate	+	
Potassium cyanide	(+)...-	Si-free alloys better than AlSi alloys; RT: (+)...(-); >RT: (-)...-; sodium water glass addn.: +
Potassium dichromate	+	<100°C
Potassium disulphate	+...(+)	RT, 10% H_2O sol.: +
Potassium ferricyanide	+	<100°C
Potassium ferrocyanide	+	
Potassium fluoride	(+)	
Potassium hydrogenfluoride	(+)...-	RT: (+)...(-); >RT: -
Potassium hydroxide	-	
Potassium iodate	+	Cu-free alloys
Potassium iodide	+...(-)	solid PI: +; aq. sol.: (+)...(-); sol. of PI and alkali nitrates in H_2O: +
Potassium nitrate, saltpeter	+...(+)	Al better than AlMg alloys
Potassium perchlorate	+	if chlorides and heavy metals present: (-)...-

Substance	Behaviour	Comments
Potassium permanganate	+	solid PP, high humidity, AlMn alloys: -
Potassium peroxide	+...-	dry: +; with water: -
Potassium persulphate	+...-	RT: +; >RT: (-)...-
Potassium phosphate	(+)...-	RT, 10% sol., Al: (+); >RT: (+)...-
Potassium rhodanide	+	Cu-free alloys
Potassium silicates, potassium water glass	+...-	RT: +...(-) (anodised: +); >RT: +
Potassium sulphate	+	
Potassium sulphide	-	
Potassium sulphite, potassium bisulphite	+...-	neutral sol., RT: +...(+); acid sol: -
Propane	+	
Propene acid, acrylic acid	+	
Propenol, allyl alcohol	+...(-)	with inhibitors (sodium water glass and sodium lactate): +; anodised: +; impure: (+)...(-)
Propionic acid	+...-	H_2O-free: -, 99% H_2O sol., m.pt.: +
Propionic anhydride	+...-	<75°C: +; v.pt.: -
Propyl alcohols	+...-	97°C, H_2O-free: +; PA with H_2O: -
Propyl ether	+	
Propylene	+	
Propylene glycol	+	
Protein solutions	+	Cu-free alloys; neutral, Cl-free sol.: +
Prussic acid, hydrocyanic acid	+	Cu-free alloys
Pyridine	+...(-)	H_2O-free: +; H_2O-containing: (+)...(-)
Pyrocatechin	+	
Pyrogallol	+	<m.pt., with a minimum quantity of H_2O: +
Pyrosulphuric acid	+...(-)	RT: +
Pyruvic acid	(+)...-	<100°C, 90% + PA: (+); diluted PA, >RT: -
Q		
Quinine	+	
Quinine hydrochloride	-	
Quinine monosulphate	+	applies only to unalloyed Al
Quinine tartrate	(+)...-	RT, neutral: (+); RT, pH from 4 to 1: -
Quinizarin	+	
Quinoline	+...(-)	>200°C, G-AlSi better than Cu-free alloys; H_2O-free, 200°C: (-)
R		
Rennin	+	
Resorcin	+	< v.pt.: +
Rhodium salts	+	dry: +
Rhubarb	+	
Ricinus oil	+	< 100°C
Rubber, latex	+	
Rust, iron oxide, hydrated	+...(+)	on Al surface promotes corrosion of Al
Rye whisky	+...(-)	Al with anodically produced oxide layer
S		
Sagrotan, aq. sol. ≤2%	+	<40°C

Substance	Behaviour	Comments
Salicylaldehyde	+	
Salicylic acid	+...(-)	H_2O-free: +...(+); moist: (+); increasing temp.: (+)...(-)
Saltpeter, potassium nitrate	+...(+)	Al better than AlMg alloys
Santonin	+	
Sauerkraut, pickled white cabbage	(+)...(-)	after cooking for long time: -
Sebacic acid	+	
Selenic acid	(+)...(-)	Al decomposes SA completely
Selenious acid	(+)...(-)	Al decomposes SA completely
Selenium	(+)...-	500°C: -
Sulphur trioxide, oleum	+...-	H_2O-free: +
Shaving cream	+...(+)	
Shellac	+	
Shoe polish	+	
Silicon	+	
Silicon dioxide	+	
Silicon tetrachloride	+...-	dry: +; moist: -
Silver nitrate solution	-	
Skin cream	+...(+)	
Slaked lime, calcium hydroxide	(-)...-	RT: (-); >RT: (-)...-
Sodium	+...-	Al alloys with low Si content <200°C: +; >500°C: -
Sodium acetate	+...(+)	Cu-free alloys: +...(+)
Sodium aluminate	(+)...(-)	
Sodium aluminium fluoride	+	
Sodium arsenates, arsenite	(+)...(-)	RT: (+); >RT: (-)
Sodium benzoate	+...(+)	diluted alkaline SB: (+)
Sodium bicarbonate	+...(+)	Cu-free alloys: +...(+)
Sodium bifluoride	(+)...-	addn. of sodium phosphate, RT: (+)
Sodium bisulphate	+...(-)	>60°: (-)
Sodium bisulphite	+...(-)	Cu-free alloys: +...(-) (anodising beneficial)
Sodium bitartrate	+	up to b.pt.
Sodium borate	+...(-)	RT: +...(+); >RT: (+)...(-)
Sodium bromate	+	SB sol. with bromides and heavy metal salts: -
Sodium bromide	(+)...(-)	RT, sodium water glass addn.: (+); >RT: (-)
Sodium bromite	+...-	dry SB: +; SB sol.: -
Sodium carbonate, soda	+...-	RT: (+)...(-); >RT: (+)...-; behaviour of AlMg alloys most favourable
Sodium chlorate	+	Cu-free alloys: +; SC with sodium chloride: -
Sodium chloride	(+)...-	
Sodium chlorite	(-)...-	
Sodium chromate	+	
Sodium citrate	(+)...-	
Sodium cyanamide	(+)...-	
Sodium cyanate	(+)...(-)	RT: (+); >RT: (+)...-
Sodium cyanide	(+)...-	RT, increasing alkalinity: (+)...-
Sodium dichromate	+	

Substance	Behaviour	Comments
Sodium diphenylsulphonate	+	
Sodium ethylate	-	
Sodium fluoracetate	+	no data for alloys
Sodium fluoride	+	
Sodium formate	+	Cu-free alloys: +
Sodium hydride	+	
Sodium hydrosulphite	(+)...-	solid: (+); aq. sol.: -
Sodium hydroxide, caustic soda	+...-	molten, H_2O-free: +; SH sol.: -
Sodium hypochlorite	+...-	with increasing alkalinity: (+)...-
Sodium hypophosphite	+	no data for alloys
Sodium iodide	+...(-)	>RT: (+)...(-)
Sodium isoalkyl barbiturate	+...-	solid, H_2O-free: -; alkaline sol.: -
Sodium lactate	+...-	RT: +; >RT: (+)...-
Sodium monofluorphosphate	+	
Sodium nitrate	+...(-)	aq. sol., RT: +; 50-90°C: (+)...(-); solid or molten: +
Sodium nitrite	+	Cu-free alloys: +
Sodium oleate	+...(+)	Cu-free alloys: +...(+)
Sodium oxalate	+...(-)	
Sodium oxide	+...-	solid, H_2O-free, RT: (+); H_2O-containing: -
Sodium perborate	+...-	< RT: +; >RT, without sodium silicate: (+)...-
Sodium percarbonate	(+)...(-)	
Sodium perchlorate	+	
Sodium peroxide	(+)...-	solid (+); aq. sol.: -
Sodium persulfate	(+)...-	RT; Cu-free alloys: (+); >RT: (+)...-
Sodium phosphate	(+)...-	primary SP: (+); secondary SP: (+); tertiary SP: (-)...-
Sodium phosphate, chlorinated	(+)...-	SP with 100 ppm chlorine: (+); SP with 2% chlorine: -
Sodium propionate	+...(+)	Cu-free alloys, RT: +; Cu-free alloys , 100°C: (+)
Sodium pyrosulphate	+...(+)	solid: +; aq. sol.: (+)
Sodium pyrosulphite	+	no data for alloys
Sodium salicylate	+	RT: +
Sodium silicates	+...-	RT, Cu-free alloys, SiO_2/Na_2O ratio <1.6: +
Sodium silicofluoride	+...-	SS sol. with 0.1% NaSiF6: +; 0.75% SS sol.: (+)...-
Sodium stannate	(+)...-	dil. sol., RT: (+); >RT: (+)...-
Sodium sulphate	+...-	solid, dry: +; 1% SS sol.: AlMg alloy, 150°C: -; Na_2SO_4 melt: - (risk of explosion!)
Sodium sulphide	(+)...-	>RT: (+)...-; sulphur addn., RT: (+)
Sodium sulphite	+...(+)	anodised: +
Sodium thioglycolate	+...(+)	Cu-free alloys: +...(+)
Sodium thiosulphate	+...(+)	
Sodium tripolyphosphate	+...(+)	solid: +; moist, aq. sol.: (+)
Sodium uranate	+	solid: +
Sodium valerate	+...(+)	RT, Cu-free alloys: +; >RT, sodium silicate addn.: (+)
Sodium vanadate solution	+...-	RT: +; v.pt.: -
Sodium zincate solution	-	
Soft drinks	+...(+)	

Substance	Behaviour	Comments
Soft soap	(+)	
Soil, earth	+...-	dry sandy soil: +; wet clayey soil, boggy soils: (+)...-; protect with bitumen coating
Solders	+..(-)	under influence of water: (+)...(-)
Soot	+	
Sorbite, glucitol	+	
Starch	+	
Steam	+...(+)	dry steam: +...(+); wet steam: (+)
Stearic acid	+...-	<190°C: +; >190°C, H_2O-free: -; H_2O-containing: +
Stearin	+	
Streptomycin	+	
Strontium hydroxide, saturated sol.	-...(+)	formation of surface film with lime
Succinic acid	+...(+)	
Sugar	+	
Sulfamic acid	+...(-)	RT: +; 55°C: (+)...(-); 95°C, conc. 50g/l: (-)
Sulphamic acid	(+)...-	RT: +...(+); >RT: (-)...-
Sulphur	+	
Sulphur dioxide	+...-	RT: +; H_2O, <350°C: (+); >400°C: -
Sulphuric acid	(+)...-	<20%, with increasing temp. and conc.: (+)...-; 100% SA, RT: (+)
Sulphuryl chloride	+...-	dry: +...(+); moist: (-)...-
T		
Talc	+	
Tall oil	+...-	RT: +; v.pt.: -
Tanigane	-	
Tannic acid	(+)...(-)	dry TA: (+); sol. of TA: (+)...(-)
Tannin	+	35°C, 10% aq. sol.: +
Tars	+...(-)	<170°C: +; >170°C: (+)...(-)
Tartaric acid, aq. sol.	+...(-)	RT: +; 50°C: (+); 98°C: (-)
Tea	+	
Tellurium	+	>500°C: -
Terpenes	(+)	
Tetrachlorethylene	+...-	T without H_2O up to 70°C: +, with H_2O, >70°C: (+)...-
Tetralin, tetrahydronaphthalene	+	up to b.pt.
Thiocarbamide, thiourea	+...(-)	solid: +; sol. of T, RT: +; >RT: (+)...(-)
Thiodiglycol	(+)	
Thionyl chloride	+...-	dry: +...(+); moist: (-)...-
Tin chloride solution	(-)...-	RT
Tincture of iodine	(+)...(-)	RT: (+); >RT: (-)
Titanium dioxide	+	
Tobacco	+	
Tosylic acid, p-toluene sulphonic acid	(+)...-	attack increases with temp. and conc.
Toluol, toluene	+	
Tomatoes	+...(+)	effect on Al insignificant; with tinned foods, protective coating
Toothpaste	+...(-)	depending on composition

Substance	Behaviour	Comments
Transformer oil	+	
Triacetylglycerine	+	
Trichlorbenzene	+	RT: +
Trichloroacetic acid	(+)...-	attack increases with temp. and conc.
Trichloroacetaldehyde, chloral hydrate, chloral	-	
Trichloroethene	+...-	used to degrease Al: +; moist: (-)...-
Tricresyl phosphate	(+)	Al; <120°C
Triethanolamine	+...-	RT: +; v.pt.: -; sol.: (+)...(-)
Trinitrophenol, picric acid	+	
Trinitrotoluene, TNT	+	up to m.pt.: +
Trioxymethylene, paraformaldehyde	+	
U		
Uranium hexafluoride	+	< 80°C: +
Urea	+	
Uric acid	-	
Urotropine, hexamethylenetetramine	+	
V		
Valeric acid	(+)...(-)	RT up to 50% VA: (+); >RT: (+)...(-)
Valeric acid, n-valeric acid	+...(-)	<50% acid: +; >50% acid: (-); >RT: (+)...(-)
Vanilla	+	
Vanillin	+	
Vapour, water	+...(+)	dry vapour: +...(+); humid vapour: (+)
Varnishes	+	
Vaseline, Petroleum	+	<v.pt.
Vinasses, molasses	+	
Vinyl acetate	+	
Vinyl chloride	+...-	H_2O-free: +; moist: -
Vinyl ether	+	
W		
Waste gases, flue gases, exhaust gases	+...(-)	above dew point, dry gases only: +; below dew point: (+)...(-)
Wax, bees-wax, etc.	+	
Whisky	+...(-)	anodised: +; otherwise detrimental effect on taste
Whiting, Spanish white	+	
Wood cement, xylolite	+...-	dry: +; moist: -
Wood tar, charcoal	+	
Water, vapour	+...(+)	dry vapour: +...(+); humid vapour: (+)
X		
Xenon	+	
Xylene	+	
Xylenols	+	assuming low H_2O contents
Y		
Yeast and molasses	+	

Substance	Behaviour	Comments
Yoghurt	(+)...(-)	depending on acidity
Z		
Zinc acetate solution	(+)...(-)	RT
Zinc borate solution	(+)...(-)	RT: (+); >RT: (+)...(-)
Zinc chloride solution	(+)...-	RT, 5% sol.: (+); >40°C: -
Zinc chromate	+	
Zinc naphthenate	+	
Zinc nitrate solution	+...-	RT: +; >RT: (+)...-
Zinc oxide	+	
Zinc stearate	+	
Zinc sulphate solution	(+)...-	RT: (+); attack increases with temp. and H_2SO_4 content
Zinc sulphide	+	
Zirconium nitrate solution	(+)...(-)	

*) N.B.:

The table is based on:

- "Das chemische Verhalten von Aluminium" – Aluminium-Verlag, Düsseldorf 1955.
- The Dechema-Werkstofftabelle (materials charts), as at January 1972.
- "Aluminium-Handbuch" – Verlag Technik , Berlin (East), 1971.
- "Beständigkeit von Aluminium gegenüber verschiedenen chemischen Stoffen" – Aluminium-Verlag, Düsseldorf 1966.
- "Process Industries Applications of ALCOA Aluminum" – Aluminum Company of America. The values taken from the literature have been augmented by investigations commissioned by the Aluminium Zentrale.

Source: Aluminium Taschenbuch Band 1 - Grundlagen und Werkstoffe, 2009, Beuth Verlag GmbH, pps. 516-543.

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