BT50 and BT30 Technical Note: T13-001

BT50 and BT30 chemical resistance chart at 20ºC

■ Introduction

Liquids dispensed with the BT50 and BT30 digital burettes will be in contact, constantly, with the following materials: Borosilicate glass, (BSG), PTFE, PVDF, FEP, Alumina Ceramic (AC) and Platinum Iridium (PI). The following table is a guide to help with the queries regarding liquid compatibility.

Please note that these tables are just a guide. We recommend that if there is a question regarding liquid compatibility you should exercise caution in use and refer to other chemical tables where available. Good laboratory practice would be to rinse out the liquid handling unit at the end of each day with distilled water to prevent corrosive liquids being left in contact with the parts for too long.

■ Chemical compatibility

CHEMICAL	BSG	PTFE	PVDF	FEP	AC	PI
Acids						
Acetic, glacial	R		VR		R	R
Acetic, 25%	R	R	R	R	R	R
Hydrochloric, concentrated	R		R		VR*	R[1]
Hydrochloric, 25%	R	R	R	R	R*	R
Sulphuric, concentrated	R		R		VR*	VR[2]
Sulphuric, 25%	R	R	R	R	R*	R
Nitric, concentrated	R		VR		VR*	VR[3]
Nitric, 25%	R		R		R	R
Phosphoric, 25%	R	R	R	R	R	VR[4]
Formic, 25%	R	R	R	R	R	
Trichloroacetic, 10%	R	R	NR	R	R	
Formic acid, 85%	R	R	R	R	R	
Arsenic acid	R		R		R	No data
Boric acid, 10%	R	R	R	R	R	No data
Chromic acid, 20%	R	R	R	R	R	No data
Hydrofluoric acid, 35%	NR	Exceptions	R	R	NR	R
Phosphoric acid 85%	R	R	R	R	NR	VR[4]
Nitric acid, 50%	R	R	R	R	R	R
Sulphuric acid, 95%	R	R	R	R	R	VR[2]
Alkalis						
Ammonium hydroxide, 25%	R	R	VR	R	R	R
Sodium hydroxide	R	R	NR	R	R	R
Potassium hydroxide	R	R	NR	R	VR	VR[5]
Sodium hydroxide	R	R	NR	R	VR	VR[6]
Alcohols						
Methanol, 98%	R	R	R		R	R
Ethanol, 98%	R		R		R	R
Ethanol, 70%	R		R		R	R
Isopropanol, n-Propanol	R		R		R	R
Amyl alcohol, Butanol	R		R		R	
Benzyl alcohol	R	R	R	R	R	
Ethylene glycol	R	R	R	R	R	
Propylene glycol	R	R	R	R	R	
Glycerol	R	R	R	R	R	

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Hydrocarbons						
Hexane, Xylene	R	R	R	R	R	
Toluene, Benzene	R	R	R	R	R	
Kerosene, Gasoline	R		R		R	
Tetralin, Decalin	R		R		R	
Halogenated Hydrocarbons						
Methyl chloride	R		R		R	
Chloroform	R	R	R	R	R	
Trichloroethylene	R	R	R	R	R	R
Monochlorobenzene, Freon	R		R		R	
Carbon tetrachloride	R	R	R	R	R	
Ketones						
Acetone	R	R	NR	R	R	
Methyl ethyl ketone	R	R	NR		R	
Isopropylacetone	R		NR		R	
Methyl isobutyl ketone	R		VR		R	
Esters						
Ethyl acetate	R	R	R		R	
Methyl acetate	R		R		R	
Amyl and Propyl acetate	R		R		R	
Butyl acetate	R	R	R	R	R	
Propylene glycol acetate	R		R		R	
2-Ethoxyethyl acetate	R		R		R	
Methyl cellosolve acetate	R		R		R	
Benzyl benzoate	R		R		R	
Isopropyl myristate	R				R	
Tricresyl phosphate	R		VR		R	
Oxides – Ethers						
Ethyl ether	R		R		R	
1,4 Dioxane and Tetrahydrofuran	R	R	VR	R	R	
Dimethylsulphoxide (DMSO)	R	R	NR	R	R	
Isopropyl ether	R		R		R	
Solvents with Nitrogen						
Dimethyl formamide	R	R	NR	R	R	
Diethylacetamide	R	R	NR		R	
Triethanolamine	R		VR		R	
Aniline	R	R	R	R	R	
Pyridine	R	R	VR	R	R	R
Miscellaneous						
Phenol, aqueous, 10%	R		R		R	R
Formaldehyde solution, 30%	R	R	R	R	R	
Hydrogen peroxide, 30%	R	R	R	R	R	R[7]
Silicone oil and Mineral oil	R		R		R	
Pyridine	R	R	VR	R	R	R
Acetaldehyde	R	R	NR	R	R	
Ammonia, 25% ac. Sol.	R	R	NR		R	R[8]
Ammonium	R		NR		R	
Calcium chloride aq. Sol	R	R	R	R	R	R
Chlorine	R	R	R	R	R	R[9]
Chlorobenzene	R		R		R	
Fluorinated hydrocarbons	R		R		VR	
Hexane	R	R	R	R		

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Iodine (tincture of)	R	R	R			R
Potassium chloride aq. Sol.	R		R			R
Potassium permanganate aq. Sol.	R		R			R[10]
Magnesium chloride aq. Sol.	R		R			R
Methylene chloride	R	R	R	R		R
Sodium carbonate	R		R			VR[11]
Sodium dichromate	R	R	R	R		No data
Phenol, 100%	R	R	R	R		R
Mercury	R	R	R	R	R[+]	NR[12]
Silver nitrate	R	R	R	R	R	R[13]
Toluene	R	R	R	R	R	
Hydrogen peroxide, 30%	R	R	R	R	R	R[7]
Xylene	R	R	R	R	R	
Zinc chloride, 10%	R	R	R	R	R	R
Zinc sulphate, 10%	R	R	R	R	R	R

Key:
R = Resistant
VR = Virtually resistant
SR = Slightly resistant
NR = Non-resistant
Exceptions = Resistant with exceptions

Notes:
* Depends on temperature
[+] Up to 300℃

■ Notes on the resistance of Platinum-Iridium

The literature indicated that Aqua-Regia (3 parts hydrochloric acid: 1 part nitric acid) will cause slight attack to 10% iridium platinum. In practice, alloys containing more than 3% iridium show a great resistance to attack, unless they are in the form of a very fine powder. This usually involves the fusion of the alloy with zinc to increase the surface area.

Notes

1. **Hydrochloric acid** – in the presence of oxidising may cause slight attack on prolonged boiling.
2. **Sulphuric acid** – will dull the surface with prolonged heating at above 250℃.
3. **Nitric acid (fuming)** – may dull the surface with prolonged heating.
4. **Phosphoric acid** – may dull the surface with prolonged heating.
5. **Potassium hydroxide** – the fused salt will cause slight attack.
6. **Sodium hydroxide** – the fused salt will cause slight attack.
7. **Hydrogen peroxide 30%** - in the presence of hydrochloric acid may cause slight attack on prolonged boiling.
8. **Ammonia** – heating in an ammonia atmosphere will darken and dull the surface, leading to a porous crystalline appearance.
9. **Chlorine** – in the presence of hydrochloric acid may cause slight attack on prolonged boiling.

10. **Potassium permanganate** – in the presence of hydrochloric acid may cause slight attack on prolonged boiling.

11. **Sodium carbonate** – the fused salt may cause slight attack.

12. **Mercury** – will readily attack at any temperature.

13. **Silver nitrate** – the fused salt may cause slight attack and discolour the surface.

14. **Organic compounds** – there is no data available on most of the organic compounds listed, it is unlikely they would have any detrimental effect but we can give no guarantee to this statement.

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