ALKALOIDAL COLOR REACTIONS

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TABLE OF CONTENTS

Alkaloidal Color Reactions

One of the properties by which alkaloids are characterized is that of producing colored compounds when treated with various reagents. This is a property by no means peculiar to alkaloids, but it is sufficiently characteristic to frequently serve as a means of detecting the presence of alkaloids; and many of the reactions are so specific that they serve for the identification of individual alkaloids. Indeed, the final indentification of most alkaloids is by means of their color reactions.

In most cases little appears to be known of the products formed by means of these color producing reagents other than that they are colored. However, most of the reagents employed to bring about the color reactions may be placed in two classes: oxidation reagents and dehydration reagents. Among the former may be included nitric acid, iodic acid, potassium dichromate, potassium permanganate, halogens, formaldehyde, etc. Among the latter, sulphuric acid, zinc chloride and acid anhydrides. Other reactions which may produce a distinct change in color are those which involve the formation of salts with considerable change in the molecular formula. We know that some alkaloids which are colorless in themselves form colored salts from which the colorless alkaloid may be regenerated. Upon the whole, however, little is known of the nature of the colored product.

Table I

ALKALOIDS	REAGENTS			
	Perru-theniate	Selenous Acid in conc. H_2SO_4	Sugar	Titanic Anhydrides
Aconitine		yellowish	orange	
Adrenaline				reddish-brown
Apomorphine		violet		reddish-violet
Aspidospermine				blue-violet
Atropine		colorless		
Atropine sulphate				
Berberine				green
Brucine		yellow-red		
Caffeine		colorless		
Cantharidin				
Chelidonime	green			
Cinchonamine				yellow
Cinchonidine				
Cinchonine				
Cocaine		colorless		
Codeine		blue-green	deep-pink	rose or red
Colchicine		lemon yellow		
Coniine		colorless		
Cubebin				
Cupreine				
Curarine				
Delphinine		red brown		rose or red
Digitalin		yellow-red		rose or red
Digitoxin				green

Table I cont'd

ALKALOIDS	REAGENTS			
	Perru-theniate	Selenous Acid in conc. H_2SO_4	Sugar	Titanic Anhydride
Emetine				rose or red
Ergotinine				green
Esserine				yellow
Heroine				blue-violet
Hordenine				deep orange
Hydrastine				rose or red
Imperatorin	blue-green			
Lobeline				blue-violet
Morphine		blue-green	light pink	blue to blood red
Morphine HCl				
Narceine		greenish yellow		yellow
Narcotine		greenish-blue		
Nicotine		yellowish		rose or red
Onanin	brownish red			
Oxydimorphine				wine red
Papaverine		greenish blue		blue-violet
Physostigmine		brownish yellow		
Picrotoxin		colorless		yellow
Pilocarpine				
Piperine				
Podophyllotoxin				yellow
Quinidine				
Quinine		colorless		yellow

Table I cont'd

ALKALOIDS	REAGENTS			
	Perru-theniate	Selenous Acid in conc.H_2SO_4	Sugar	Titanic Anhydride
Quinine sulfate				
Salicin				
Santonin				
Saponin				
Sparteine				
Senegin				
Solanine	red	reddish yellow		
Strychnine		colorless		yellow
Thebaine		deep orange		
Tyrosine				
Veratrine		lemon yellow-olive green	dark red-blue	rose or red

Table II

ALKALOIDS	REAGENTS			
	Zinc Chloride	Furfural with H_2SO_4	Chloral hydrate with H_2SO_4	Ammonium Sulpho-selenite
Aconitine				rose
Adrenaline				
Apomorphine				
Aspidospermine				
Atropine				
Atropine sulphate				
Berberine	yellow			yellow-red
Brucine				reddish
Caffeine				
Cantharidin				
Chelidonine				
Cinchonamine				
Cinchonidine				
Cinchonine				
Cocaine				
Codeine		red brown	green	
Colchicine				
Coniine				
Cubebin	crimson			
Cupreine				
Curarine				violet

Table II cont'd

ALKALOIDS	REAGENTS			
	Zinc chloride	Furfural with H_2SO_4	Chloral hydrate with H_2SO_4	Ammonium sulpho-selenite
Delphinine	brown red			reddish
Digitalin	chestnut brown	brown		yellowish
Digitoxin				
Emetine				
Ergotinine				
Esserine				lemon yellow
Heroine				
Hordenine				
Hydrastine				
Imperatorin				
Lobeline				
Morphine		red brown	green	greenish blue
Narceine	olive green		red	yellowish green
Narcotine			yellowish green	bluish
Onanin				
Oxydimorphine				
Papaverine		brownish	violet	bluish green
Physostigmine				
Picrotoxin			red	
Pilocarpine				
Piperine				
Podophyllotoxin				

Table II cont'd

ALKALOIDS	REAGENTS			
	Zinc chloride	Furfural with H_2SO_4	Chloral hydrate with H_2SO_4	Ammonium sulpho-selenite
Quinidine				
Quinine	pale green	brown green		
Quinine sulfate				
Salicin	reddish-violet			
Santonin	bluish violet			
Saponin				yellowish
Sparteine				
Senegin				dirty yellow
Solanine			red brown	canary yellow
Strychnine	bright rose red	dirty brown	yellow	
Thebaine	yellow		red	
Tyrosine				
Veratrine	red	yellow-greenish blue	red	

Table III

ALKALOIDS	REAGENTS			
	Ammonium uranate	Chlorinated lime	p-dimethyl amido-benz-aldehyde	Sulfuric Acid
Aconitine		greenish yellow		yellowish brown
Adrenaline				
Apomorphine				
Aspidospermine				
Atropine				
Atropine sulphate				
Berberine				
Brucine		light green		pink
Caffeine				green
Cantharidin				
Chelidonine				
Cinchonamine				
Cinchonidine		yellow		
Cinchonine		yellow		
Cocaine				
Codeine	blue		red	
Colchicine				
Coniine				
Cubebin				
Cupreine				
Curarine				

Table III cont'd

ALKALOIDS	REAGENTS			
	Ammonium uranate	Chlorinated lime	p-dimethyl amido-benz-aldehyde	Sulfuric acid
Delphinine				
Digitalin				black brown
Digitoxin				
Emetine				brown
Ergotinine				
Esserine				
Heroine				
Hordenine				
Hydraatine				
Imperatorin	blue			
Lobeline				
Morphine	dirty green		red	light pink
Morphine HCl				
Narceine				
Narcotine			orange	
Nicotine				
Onanin				
Oxydimorphine				
Papaverine			orange	
Physostigmine			green	
Picrotoxin				
Pilocarpine				
Piperine				blood red

Table III cont'd

ALKALOIDS	REAGENTS			
	Ammonium uranate	Chlorinated lime	p-dimethyl amido-benz-aldehyde	Sulfuric acid
Podophyllotoxin				
Quinidine				
Quinine			red brown	
Quinine sulfate				
Salicin				blood red
Santonin				
Saponin				
Sparteine				
Senegin				
Solanine				
Strychnine				
Thebaine				
Tyrosine				
Veratrine		light green	green	deep red

Table IV

ALKALOIDS	REAGENTS			
	Sulfuric acid and sugar	Potassium dichromate	Paraldehyde with H_2SO_4	Euchlorine ($KClO_3$ and HCl)
Aconitine		green		
Adrenaline				
Apomorphine			violet	
Aspidospermine				
Atropine		dark green		
Atropine sulphate	violet			
Berberine				
Brucine		bright red		violet
Caffeine		dark green		
Cantharidin				
Chelidonine				
Cinchonamine				
Cinchonidine		green		
Cinchonine		green		
Cocaine				
Codeine	cherry red	black	orange	
Colchicine				
Coniine				
Cubebin				
Cupreine				
Curarine				
Delphinine				

Table IV cont'd

ALKALOIDS	REAGENTS			
	Sulfuric acid and sugar	Potassium dichromate	Paraldehyde with H_2SO_4	Euchlorine ($KClO_3$ and HCl)
Digitalin		green		
Digitoxin				
Emetine		green		
Ergotinine				
Esserine				
Heroine				
Hordenine				
Hydrastine				
Imperatorin				
Lobeline				
Morphine		dirty brown	orange	
Morphine HCl	rose			
Narceine				
Narcotine	mahogany			yellow
Nicotine				
Onanin				
Oxydimorphine				
Papaverine			yellowish red	
Physostigmine				
Picrotoxin			yellow	
Pilocarpine				
Piperine		very dark		
Podophyllotoxin				

Table IV cont'd

ALKALOIDS	REAGENTS			
	Sulfuric acid and sugar	Potassium dichromate	Paraldehyde with H_2SO_4	Euchlorine ($KClO_3$ and HCl)
Quinidine		green		
Quinine		green		yellowish pink
Quinine sulfate	greenish			
Salicin	bright red	dark		
Santonin				
Saponin				
Sparteine				
Senegin				
Solanine			orange	
Strychnine	reddish	deep violet		red
Thebaine				
Tyrosine				
Veratrine	dark green	reddish brown	red brown	

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Approved Nellie Wakeman

Asst in Pharm Chem

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