



UNIVERSIDADE DE SÃO PAULO
 FACULDADE DE CIÊNCIAS FARMACÊUTICAS
 Departamento de Alimentos e Nutrição Experimental

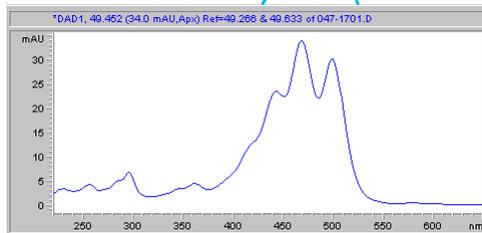
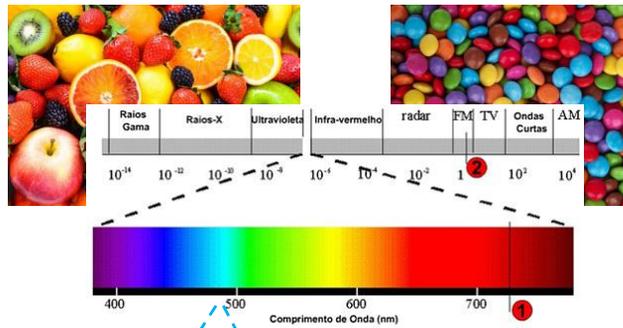


FBA – 0201 Bromatologia

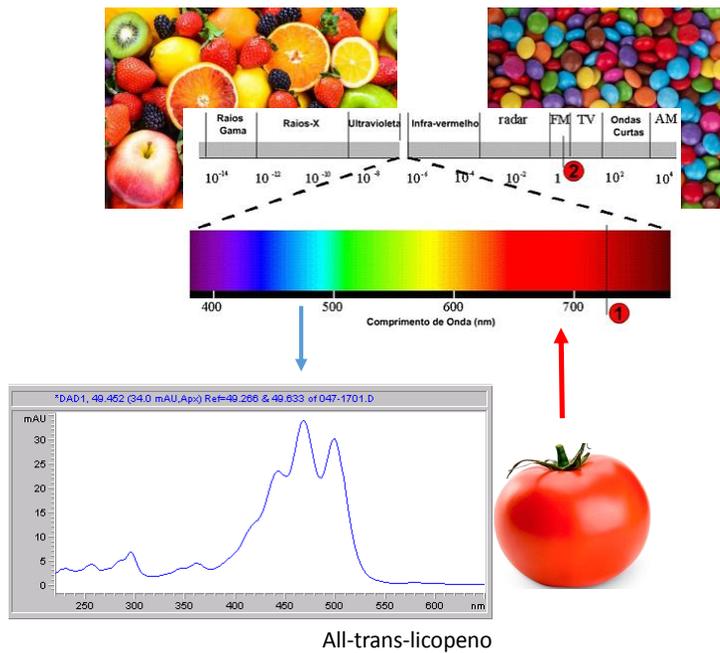
PIGMENTOS e CORANTES EM ALIMENTOS

Prof. Neuza Hassimotto

Novembro 2023



All-trans-licopeno



DEFINIÇÕES:

- ❖ **Corantes orgânicos naturais:** São aqueles obtidos a partir de vegetais, ou eventualmente de animais.
- ❖ **Corantes orgânicos artificiais:** São aqueles obtidos por processo de síntese com composição química definida.
- ❖ **Corantes sintéticos idênticos aos naturais:** São aqueles cujas estruturas químicas são semelhantes à dos corantes orgânicos naturais, porém são sintetizados.
- ❖ **Corante inorgânicos:** Obtidos a partir de substâncias naturais purificados de maneira adequada
- ❖ **Caramelo:** obtido pelo aquecimento do açúcar a altas temperaturas

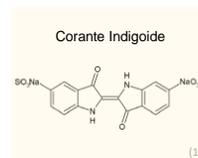
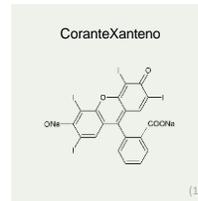
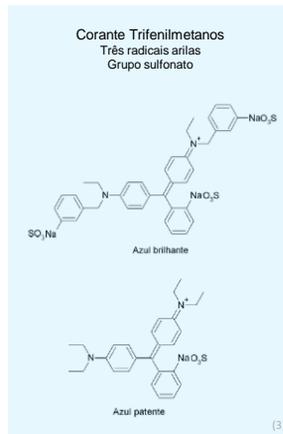
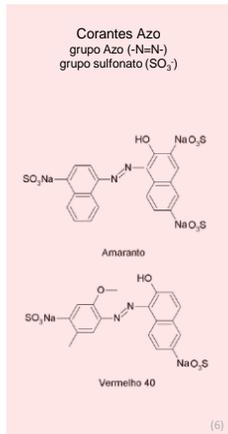
CORANTES ORGÂNICOS SINTÉTICOS ARTIFICIAIS

CORANTES ORGÂNICOS SINTÉTICOS ARTIFICIAIS

Corantes orgânicos artificiais alimentícios permitidos no Brasil

Nome usual	Tartrazina	Amarlo Crepúsculo	Azorrubina	Amaranto	Ponceau 4R	Eritrosina	Vermelho 40	Azul Patente V	Azul Indigotina	Azul Brilhante	Verde Rápido
Nome Químico	sal tri-sódico 5-hidróxi-1-(4-sulfonil)-4-[(4-sulfonil)azo]pirazole-3-carboxilato	sal di-sódico 6-hidróxi-5-[(4-sulfonil)azo]-naftaleno-2-sulfonato	sal di-sódico 4-hidróxi-3-[(4-sulfonil)azo]-naftaleno-1-sulfonato	sal tri-sódico do ácido 3-hidróxi-4-(4-sulfonil)-1-naftilazo)-naftaleno-2,7-di-sulfonato	sal tri-sódico 7-hidróxi-8-(4-sulfonil)-1-naftilazo)-naftaleno-1,3-di-sulfonato	sal di-sódico 2,4,5,7-tetraido fluoresceína	sal di-sódico de 1-(2-metóxi-5-metil-4-sulfonilazo)-2-naftol-6-sulfonato	sal de cálcio di-4-[diethylamino ciclohexa-2,5-dimilideno-(4-dietilamino)fenil]metil]-4-hidróxi-benzeno-1,3-di-sulfonato	sal di-sódico do ácido 5,5'-indigotino sulfonato	sal tri-sódico de 4',4"-di(n-etil-3-sulfonatobenzil amino)-trifenil metil-2-sulfonato	sal tri-sódico 4-[4-(n-etil-p-sulfobenzil amino)-fenil]-4-hidróxi-2-sulfonil-metileno)-1-(n-etil-n-p-sulfobenzil)-2,5-ciclohexadienimina
Sinónimos	Tartrazine, FD&C Yellow No. 5, Food Yellow No. 4	Sunset yellow FCF, Food Yellow No. 5, FD&C Yellow No. 6	Carmoisine, Food Red 3, Acid red 14	Amaranth, Food Red No. 2; Bordeaux S	New coccine, Food Red 7, Food Red No. 102	Erythrosine B, Food Red 14, Acid Red 18	Allura Red AC, Food Red 17	Acid blue 3, Patent Blue V, Food Blue 5	Indigo carmine, FD&C Blue No. 2, Food Blue No. 2	FD&C Blue No. 1, Food Blue 2, Brilliant blue FCF	Fast green FCF, Food Green 3, FD&C Green No. 3
Classe	monoazo	monoazo	monoazo	monoazo	monoazo	xanteno	monoazo	trifenilmetano	indigóide	trifenilmetano	trifenilmetano
Código Brasil	E-102	E-110	E-122	E-123	E-124	E-127	E-129	E-131	E-132	E-133	E-143
Absorção Máxima (nm)	426	480	515	523	505	526	502	635	610	629	625
Cores	amarelo	amarelo	vermelho	vermelho	vermelho	vermelho	vermelho	azul	azul	azul	azul

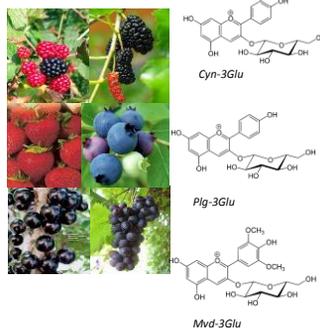
Fonte: Zanoni & Yamanaka, 2016



Corantes Naturais:

Corantes Naturais:

3. ANTOCIANINAS



Cyn-3Glu

Plq-3Glu

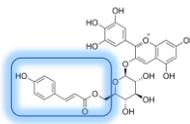
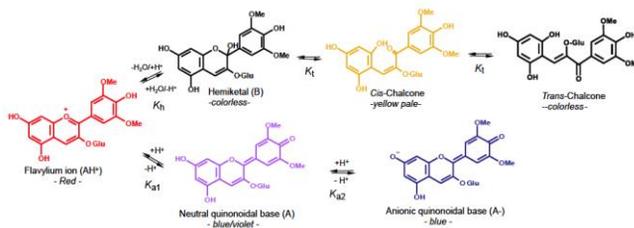
Mvd-3Glu



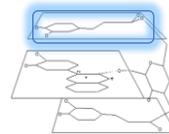
- Bebidas alcoólicas
- Bebidas não alcoólicas
- Confeitos
- Lácteos e Sorvetes

Corantes Naturais: 2. Antocianinas

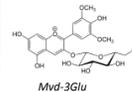
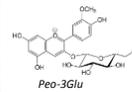
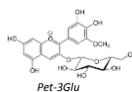
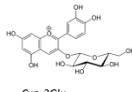
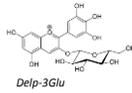
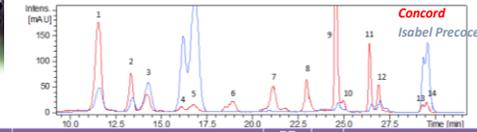
Corantes Naturais: 2. Antocianinas



Delphinidina-3- O-(6-p-coumaroil)glucosideo



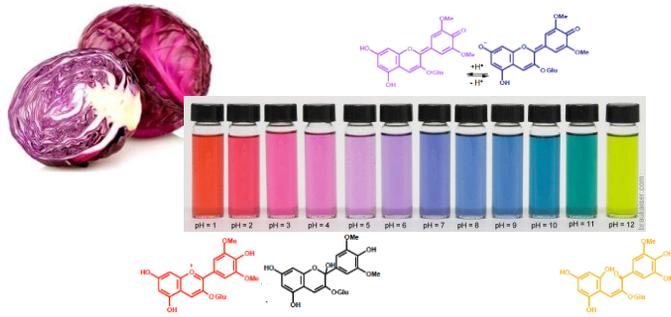
Resíduos da Indústria do Suco de Uva



Pico	Antocianina	RT (min)	MS	MS 2/MS 3
1	Delphinidina-3-glucosídeo	11,8	465	303/257/149
2	Cianidina-3-glucosídeo	13,4	449	287/257/186
3	Petunidina-3-glucosídeo	14,3	479	317/301/273/217
4	Peonidina-3-glucosídeo	16,2	483	301/286/257
5	Malvidina-3-glucosídeo	16,9	493	331/241/179
6	Delphinidina-3-acetilglucosídeo	19,0	507	303/272/99/228/93/149
7a	Cianidina-3-(p-coumaril)glucosídeo	20,7	757	595/287/203
7b	Delphinidina-3-(p-coumaril)glucosídeo	21,2	773	611/465/303/258/176
7c	Petunidina-3-acetilglucosídeo	21,7	521	317
8	Cianidina-3-(p-coumaril)glucosídeo	23,0	757	595/287/231/165
9	Delphinidina-3-coumaril-hexosídeo	24,6	611	303/257/173
10	Não identificado ion molecular ou MS2 e MS3	25,0		
11	Cianidina coumaril hexosídeo	26,4	595	287/217/135
12	Petunidin 3-p-coumaril glucosídeo	27,0	625	317/302
13	Não ionizou			
14	Malvidina-3-coumarilglucosídeo	29,6	639	331/179

Moro et al., 2019

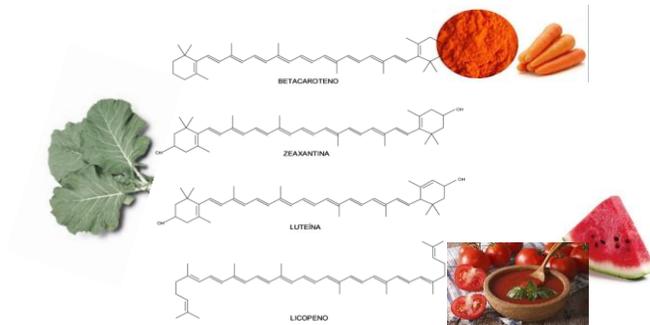




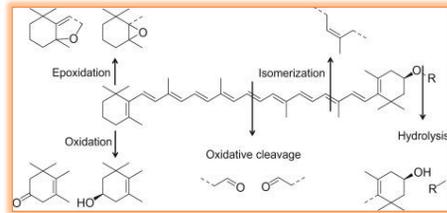
<https://www.assimquefaz.com/como-medir-o-ph-do-repolho-roxo/>

Corantes Naturais: 4. CAROTENOIDES

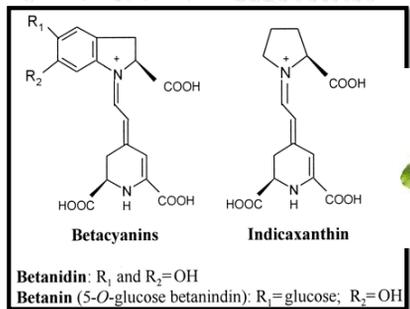
Corantes Naturais: 4. CAROTENOIDES



- ✓ Calor
 - ✓ Oxidação
 - ✓ Luz
- } **Oxidação de carotenoides**



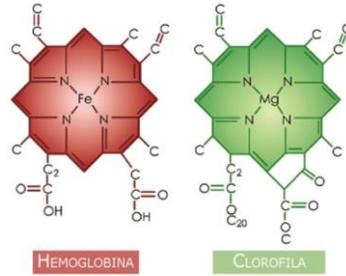
Corantes Naturais: 4. BETALAÍNAS



Temperatura + acidez, O₂ + água: DEGRADAÇÃO
 Armazenamento do corante em pó: baixa Aa (Aw)

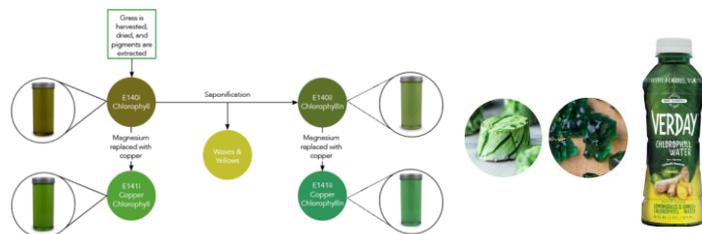
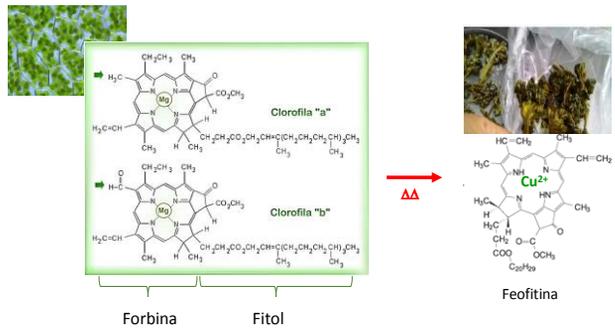
PIGMENTOS PORFIRINA

பிளமென்ட் போர்஫ிரினா



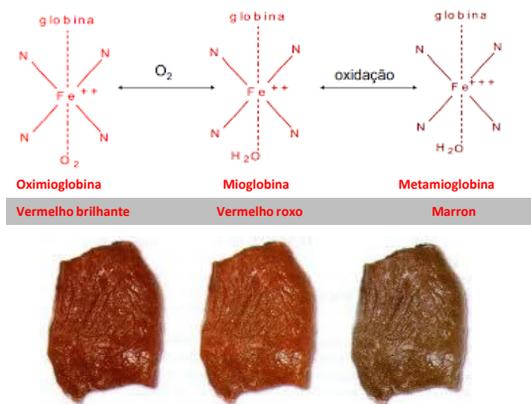
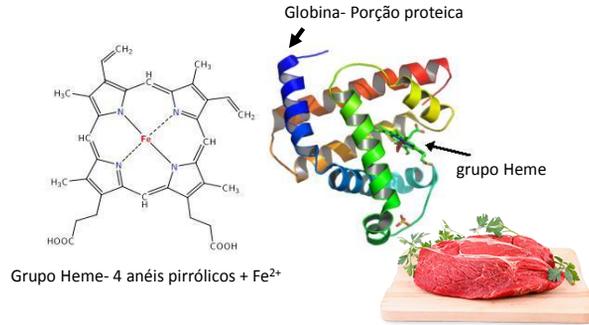
Pigmento Porfirina: 2. CLOROFILA

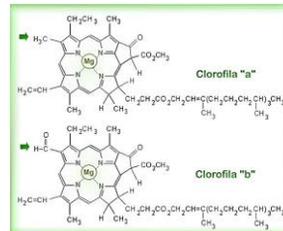
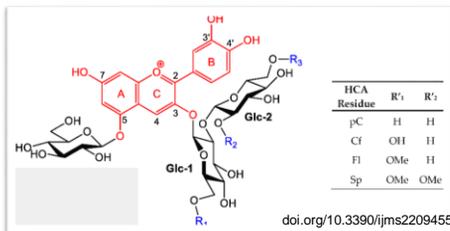
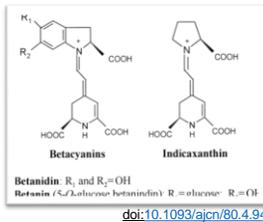
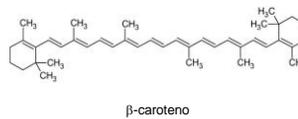
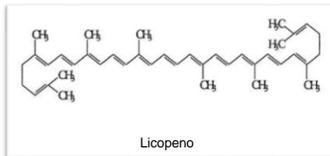
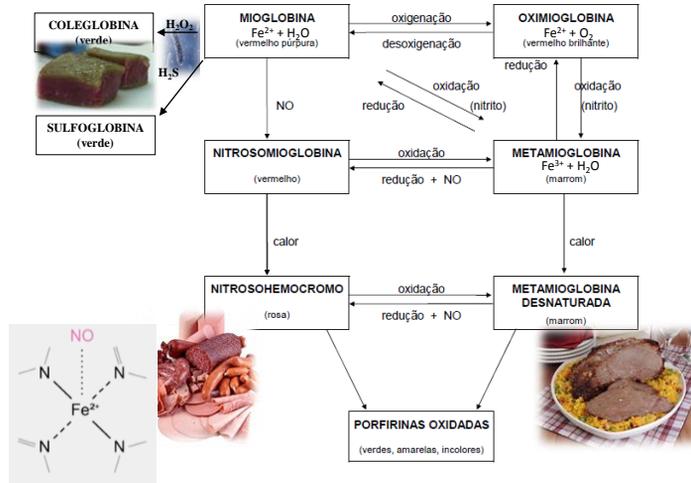
பிளமென்ட் போர்஫ிரினா: 2. சிளோ஫ிலா



Pigmento Porfírico: 1. MIOGLOBINA

ΠΡΩΤΕΙΝΟ ΠΟΡΦΙΡΙΝΟ Γ ΜΙΟΓΛΟΒΙΝΗ





CORANTES INORGÂNICOS

CORANTES INORGÂNICOS

- Dióxido de titânio- cor branca (INS 171)
- Óxido de ferro- preto, amarelo, vermelho (INS 171i, 171ii, 171iii)
- Alumínio (INS 173)
- Prata (INS 174)
- Ouro (INS 175)

INS- *International Numbering System*

Sistema numérico de identificação de aditivos alimentares

Codex alimentarius