



12/02/2024

Replacing Artificials

Alternatives to Red 40 / Allura Red / E129

Givaudan
Human by nature

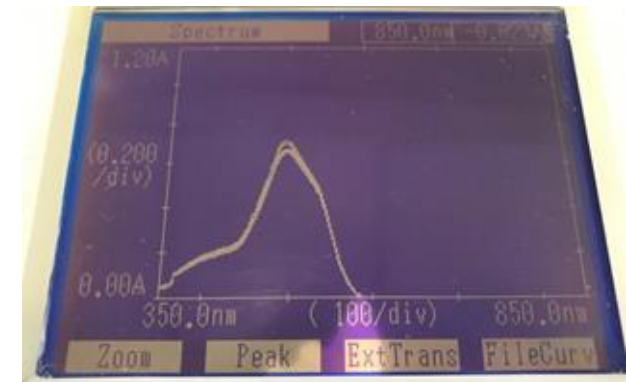
Red 40 Overview

Red 40 / Allura Red / E129

- Monoazo color -N=N-
- Well-studied in animal models, no genotoxicity or mutagenicity
- Very bad reputation
 - Urticaria (rashes) & angioedema (swelling) noted in sensitive people
 - Increases ADHD symptoms (McCann, 2007)
- Neutral red shade
- Max absorbance at $\lambda = 499$ nm
- No bathochromic or hypochromic effect in that range.
- Maximum absorbance at 499 nm
- Negligible hypochromia in the investigated range

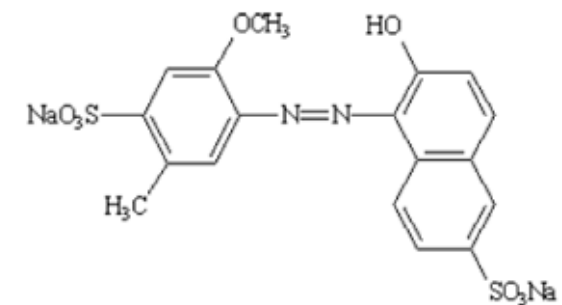


pH 2.1-6.3



Bathochromy and hypochromy are the shifts of the spectrum of a dye towards larger or smaller wavelengths respectively.

Hypochromia is the reduction of molar absorbance (maximum of the spectral curve)



Natural Options



Amaize[®] Red

- Anthocyanin source high in cyanidins, similar in shade to black carrot & elderberry
- Derived from purple corn
- Kosher & Halal
- Vibrant pink-y red shade
- Max absorbance at 520 nm
- Shifts hue to more pink-y purple as the pH increases



pH 2.5-4.0





Amaize[®] Orange-Red

- Anthocyanin source high in pelargonidins, similar in shade to red radish
- Derived from proprietary non-GM purple corn hybrid
- Kosher & Halal
- Vibrant orange-red shade
- Max absorbance at 500 nm
- Shifts hue to more pinky shade as the pH increases
- Has a much more neutral taste than radish, which has what is described as a 'sulfur-y' taste



pH 2.5-4.0





Vegebrite® Red Radish

- Anthocyanin source high in pelargonidins
- Derived from red radish sources
- Kosher & Halal
- Vibrant orange-red shade
- Max absorbance at 500 nm
- Shifts hue to more pink-y shade as the pH increases
- Tends to have what is described as a 'sulfur-y' taste



pH 2.5-4.0





Vegebrite® Black Carrot

- Anthocyanin source high in cyanidins
- Derived from black/purple carrots
- Kosher & Halal
- Vibrant pink-y red shade
- Max absorption at 520 nm
- Shifts hue to more pink-y purple as the pH increases



pH 2.5-4.5



Red Beet (betalains)

- Obtained from red beets
- Magenta shade (due to betacyanins, the most abundant betalain)
- Max absorbance at λ 530-535 nm (very close to Red 3)
- Very heat sensitive, but there are options with improved stability to heat (Endure Red Beet)
- Very light sensitive in applications with high water activity



pH 3.0-7.0





Carmine

- Anthraquinone derivative
- Not Kosher or Halal
- Animal origin
- Required declaration by name (FDA USA)
- Magenta shade
- Max absorbance at λ 520 nm (a little less blue than Red 3)
- Precipitates in acidic environments and can shift to orange
- Can be stabilized for certain applications with moderate acidity (yogurt)



pH 4.0-7.0



Red

Collection at a glance

Colour Shades		Name	Form	Main Ingredient	Sweet Goods & Dairy	Beverages	Meat Analogues	Savoury	Pet Food
		Amaize® Red	PWS, LWS	Purple corn extract	Y	Y	-	Y	Y
		Vegebrite® Black Carrot	PWS, LWS	Black carrot extract	Y	Y	-	-	Y
		Vegebrite® Organic Black Carrot	LWS	Black carrot extract	Y	Y	-	-	-
		Elderberry	LWS	Elderberry extract	Y	Y	-	-	-
		Amaize® Orange Red	LWS, PWS	Purple corn extract	Y	Y	-	Y	-
		Amaize® Red Berry Blend	LWS	Purple corn extract, Black Carrot	Y	Y	-	Y	Y
		Red Radish	PWS, LWS	Radish extract	Y	Y	Y	Y	-
		Vegebrite® Strawberry Red	LWS	Carrot, radish	Y	Y	-	-	-
		Vegebrite® Cherry Red	LWS	Carrot, elderberry	Y	Y	-	-	-
		Carmine	PWS, LWS, OSS, LOD	Carmine extract	Y	Y	Y	Y	Y
		Lycopene	LWD	Lycopene extract	Y	Y	-	-	-
		emSeal® Red Beta-carotene	LWD	Red Beta-carotene	Y	Y	-	-	-
		Endure Red Beet	PWS	Beet Extract	Y	Y (instant)	Y	-	Y
		Vegebrite® Forest Fruit	PWS, LWS	Black carrot extract	Y	Y	-	-	-

Natural Colors in Application

Beverages

Red 40



Red Radish



Red Radish
+
Vegebrite
Black Carrot



Amaize®
Orange Red



Amaize® Red



Vegebrite®
Black Carrot



Cranberry Red
Blend



Givaudan

Confections

Gummies							
	Red 40	Carmine	Red Anthocyanins	Carmine + Carminic acid	Vegebrite® Black Carrot + Paprika	Vegebrite® Strawberry Red + Vegebrite® Safflower	Amaize® Orange-Red
Boiled Sweets							
	Red 40	Carmine	Carmine + Carminic acid	Red Anthocyanins	Vegebrite® Raspberry Red	Vegebrite® Strawberry Red	
Fruit Chews							
	Red 40	Natural Red Beta- Carotene	Red Anthocyanins	Carmine + Carminic acid	Amaize® Orange-Red		

Confections

Panned Candies



Red 40



Vegebrite® Red Radish



Amaize® Orange Red



Beet + Annatto



Black carrot

White Chocolate



Red 40



michroma™ Radish



Michroma™
berry red



Acidified Radish



michroma™ Radish

Frozen Desserts

Ice Pops



Red 40



Vegebrite® Red
Radish



Vegebrite®
Strawberry Red



Amaize®
Orange-Red

Sorbet



Red 40



Vegebrite®
Red Radish



Vegebrite®
Strawberry Red



Amaize® Red

Ice Cream



Red 40



Vegebrite® Beetroot +
Annatto Extract

Givaudan

Bakery

Cakes

Red 40



Endure Red Beet



Endure Red Beet Blend



Carmine Blend



Macarons



Frostings & Fillings

Buttercreams



Red 40



Carmine + Paprika



michroma™ + Carmine



Radish

Fruit Fillings



Red 40



michroma™ Red



Ac. michroma™ Radish



michroma™ +
Carmine

Fat Fillings



Red 40



Vegebrite® Strawberry
Red



Vegebrite®
Black Carrot



Amaize® Orange-Red



Amiaze® Red
Berry Blend

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Snacks

Seasonings



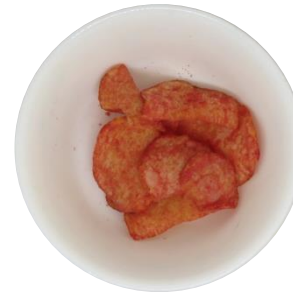
FD&C Red 40
Lake



michroma®
Berry Red



Amaize®
Orange-Red



Amaize® Orange-Red +
Paprika OS

Slurries



FD&C Red 40
Lake



michroma™
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Amaize®
Orange-Red



michroma Acidified
Radish

Extrusion



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