percieved color terms (colorness: cube root coordinates)

percieved color terms	name and relationship with standard chromaticity values	notes:
lightness	$L^* = 116\,(\,Y\,/\,100\,)^{1/3} - 16$	*definition 1976 in:*
	Aproximation: $L^* = 100\,(\,Y\,/\,100\,)^{1/3}$	*CIELUV, CIELAB*
chromaticness	*for linear chromatic value diagram (AT, B)*	
red−green	$a^* = 500\,[\,(X\,/\,X_n)^{1/3} - (Y\,/\,Y_n)^{1/3}\,]$	*definition 1976 in:*
	$= 500\,(\,a' - a'_n\,)\,Y^{1/3}$	*CIELAB*
yellow−blue	$b^* = 200\,[\,(Y\,/\,Y_n)^{1/3} - (Z\,/\,Z_n)^{1/3}\,]$	
	$= 500\,(\,b' - b'_n\,)\,Y^{1/3}$	*n=D65 (surround)*
radial	$C^* = [\,a^{*2} + b^{*2}\,]^{1/2}$	
saturation	**= chromaticness / lightness**	*definition*
red−green	$S_a^* = a^* / [\,100\,(\,Y\,/\,100\,)^{1/3}\,]$	*for:*
	$= 21{,}6\,(\,a' - a'_n\,)$	*CIELAB 1976*
yellow−blue	$S_b^* = b^* / [\,100\,(\,Y\,/\,100\,)^{1/3}\,]$	
	$= 21{,}6\,(\,b' - b'_n\,)$	
radial	$S_c^* = C^* / [\,100\,(\,Y\,/\,100\,)^{1/3}\,]$	
	$= 21{,}6\,[\,(\,a' - a'_n\,)^2 + (\,b' - b'_n\,)^2\,]^{1/2}$	
chromaticity	*for nonlinear chromaticity diagram (a', b')*	*definition*
red−green	$a' = (\,1\,/\,X_n\,)^{1/3}\,(\,x\,/\,y\,)^{1/3}$	*opponent*
yellow−blue	$= 0{,}2191\,(\,x\,/\,y\,)^{1/3}$ for *D65*	*color system*
radial	$b' = -\,0{,}4\,(\,1\,/\,Z_n\,)^{1/3}\,(\,z\,/\,y\,)^{1/3}$	
	$= -\,0{,}08376\,(\,z\,/\,y\,)^{1/3}$ for *D65*	
	$c' = [\,(\,a' - a'_n\,)^2 + (\,b' - b'_n\,)^2\,]^{1/2}$	

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color valence metrics terms (color values: linear coordinates)

color valence metric terms	name and relationship with standard chromaticity values	notes:
luminous value	$Y = y\,(\,X + Y + Z\,)$	*definition in:*
		CIEXYZ 1931
chromatic value	*for linear chromatic value diagram (AT, B)*	
red−green	$A = [\,X\,/\,Y - X_n\,/\,Y_n\,]\,Y = [\,a - a_n\,]\,Y$	*definition*
	$= [\,x\,/\,y - x_n\,/\,y_n\,]\,Y$	*opponent*
yellow−blue	$B = -\,0{,}4[\,Z\,/\,Y - Z_n\,/\,Y_n\,]\,Y = [\,b - b_n\,]\,Y$	*color system*
	$= -\,0{,}4[\,z\,/\,y - z_n\,/\,y_n\,]\,Y$	*n=D65 (surround)*
radial	$C = [\,A^2 + B^2\,]^{1/2}$	
saturation value = chromatic value / luminous value		*definition*
red−green	$S_a = A\,/\,Y = X\,/\,Y - X_n\,/\,Y_n$	*opponent*
	$= x\,/\,y - x_n\,/\,y_n = a - a_n$	*color system*
yellow−blue	$S_b = B\,/\,Y = -\,0{,}4\,[\,Z\,/\,Y - Z_n\,/\,Y_n\,]$	
	$= -\,0{,}4[\,z\,/\,y - z_n\,/\,y_n\,] = b - b_n$	
radial	$S_c = C\,/\,Y$	
	$= [\,(a - a_n)^2 + (b - b_n)^2\,]^{1/2}$	
chromaticity value	*for linear chromaticity diagram (a, b)*	*definition*
red−green	$a = X\,/\,Y = x\,/\,y$	*opponent*
yellow−blue	$b = -\,0{,}4\,[Z\,/\,Y] = -\,0{,}4\,[z\,/\,y\,]$	*color system*
radial	$c = [\,(a - a_n)^2 + (b - b_n)^2\,]^{1/2}$	

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