

Equations: colorimetric data transfer from LCH^*_a (CIELAB) to nce^* and olv^*_3

Given: CIELAB data of any colour L^* , $C^*_{ab,a}$, $h_{ab,a} = LCH^*_a = LAB^*LCH^*_a$ or L^* , a^*_a , b^*_a

CIELAB data L^* , $C^*_{ab,a}$, $h_{ab,a}$, a^*_a , b^*_a of eight basic colours $X = OYLCVMNW$

Aim: nce^* and rgb device data olv^*_3 of the given colour (in example M located between O and Y)

$$\text{CIELAB Hue angle of colour and maximum colour } M \quad h_{ab,a} = h_{ab,a,M} \quad (0 \leq h_{ab,a} \leq 360) \quad (1)$$

$$\text{Relative device hue angle ratio of } M \quad \alpha_{a,M} = [h_{ab,a,M} - h_{ab,a,O}] / [h_{ab,a,Y} - h_{ab,a,O}] \quad (2)$$

$$\text{CIELAB lightness of } M \quad L^*_M = \alpha_{a,M} L^*_{a,Y} + (1 - \alpha_{a,M}) L^*_{a,O} \quad (3)$$

$$\text{CIELAB red-green chroma of } M \quad a^*_{a,M} = \alpha_{a,M} a^*_{a,Y} + (1 - \alpha_{a,M}) a^*_{a,O} \quad (4)$$

$$\text{CIELAB yellow-blue chroma of } M \quad b^*_{a,M} = \alpha_{a,M} b^*_{a,Y} + (1 - \alpha_{a,M}) b^*_{a,O} \quad (5)$$

$$\text{radial CIELAB chroma of } M \quad C^*_{ab,a,M} = [a^*_{a,M}{}^2 + b^*_{a,M}{}^2]^{1/2} \quad (6)$$

$$\text{relative lightness of the given colour} \quad l^* = [L^* - L^*_N] / [L^*_W - L^*_N] \quad (7)$$

$$\text{relative chroma of the given colour} \quad c^* = C^*_{ab,a} / C^*_{ab,a,M} \quad (8)$$

$$\text{relative triangle lightness of the given colour} \quad t^* = l^* - [L^*_M - L^*_N] / [L^*_W - L^*_N] c^* + 0,5 c^* \quad (9)$$

$$\text{relative blackness of the given colour} \quad n^* = 1 - t^* - 0,5 c^* \quad (10)$$

$$\text{relative whiteness of the given colour} \quad w^* = 1 - n^* - c^* \quad (11)$$

$$\text{elementary hue angle of the given colour} \quad e^* = \text{function} [h_{ab,a}] \quad (\text{with table/equation}) \quad (12)$$

$$\text{relative } olv^*_3 \text{ data of } M \quad o^*_{3,M} = \alpha_{a,M} o^*_{3,Y} + (1 - \alpha_{a,M}) o^*_{3,O} \quad (13)$$

$$l^*_{3,M} = \alpha_{a,M} l^*_{3,Y} + (1 - \alpha_{a,M}) l^*_{3,O} \quad (14)$$

$$v^*_{3,M} = \alpha_{a,M} v^*_{3,Y} + (1 - \alpha_{a,M}) v^*_{3,O} \quad (15)$$

$$\text{relative } olv^*_3 \text{ data of the given colour} \quad o^*_3 = w^* + c^* o^*_{3,M} \quad (16)$$

$$l^*_3 = w^* + c^* l^*_{3,M} \quad (17)$$

$$v^*_3 = w^* + c^* v^*_{3,M} \quad (18)$$