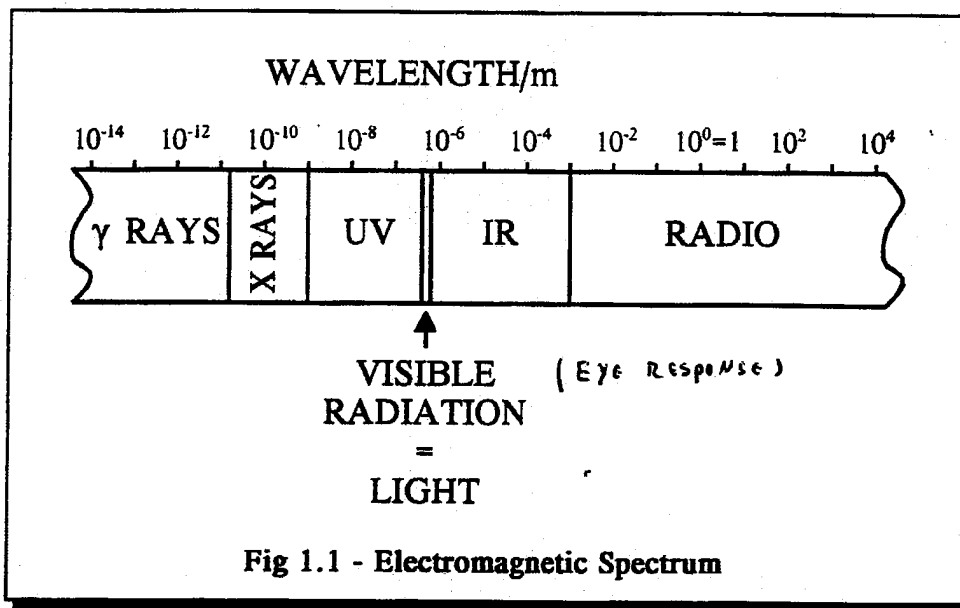


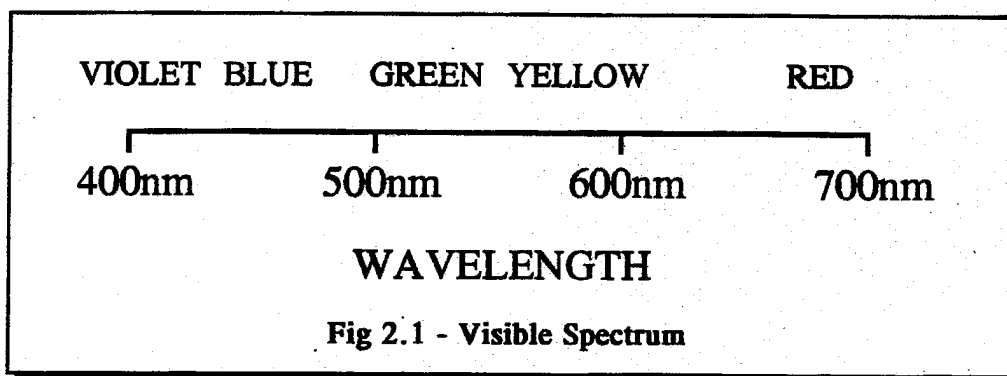
Reasons for seemingly low levels Lumen Output on Colour LEDs

LIGHTING UNITS AND CALCULATIONS

1. ELECTROMAGNETIC SPECTRUM



2. VISIBLE SPECTRUM



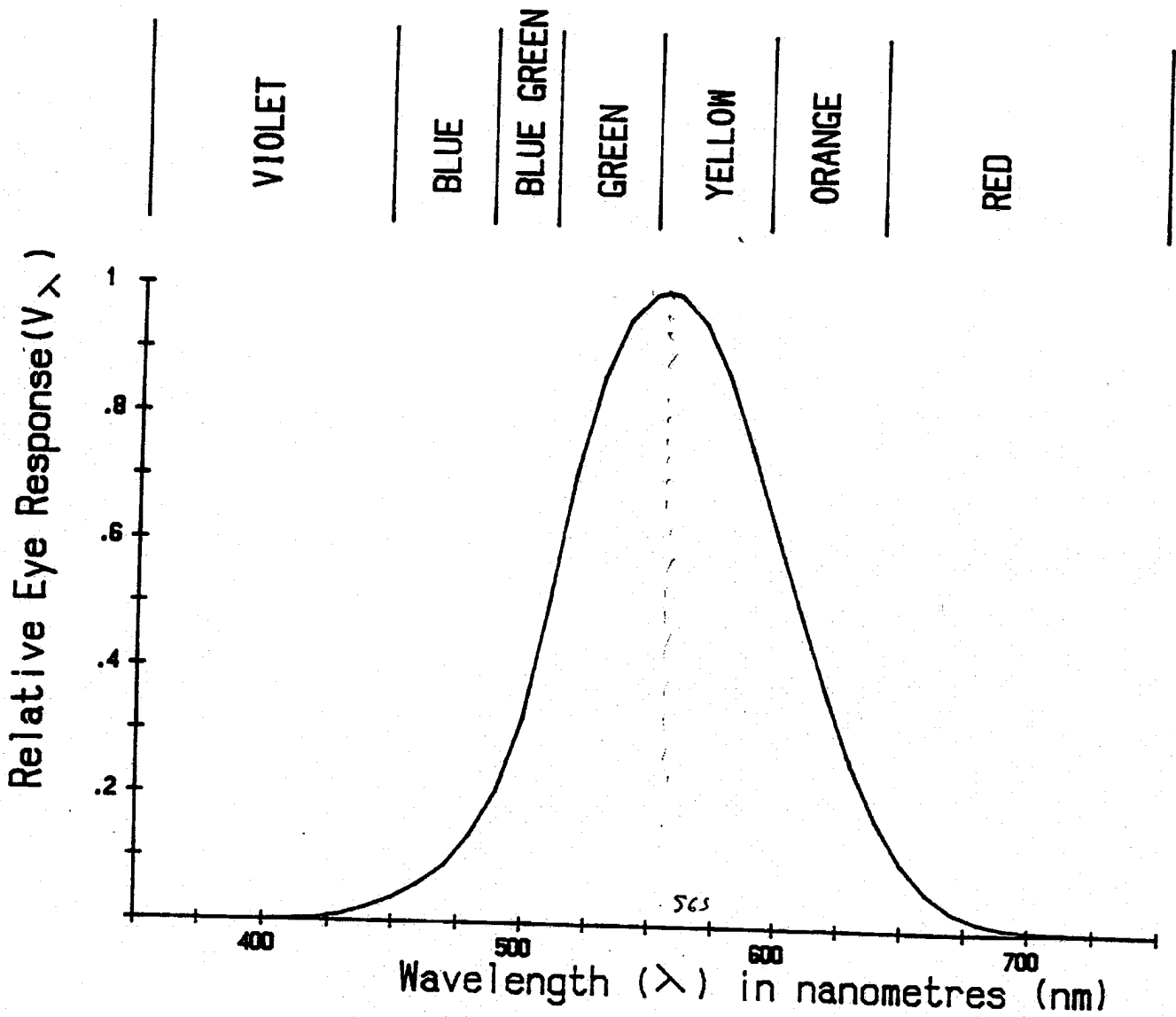
Extends from 400 nm to 700 nm approximately. That is, from 400×10^{-9} m to 700×10^{-9} m or 4×10^{-7} m to 7×10^{-7} m as shown in fig 2.1.

3. ABSOLUTE EYE SENSITIVITY

Fig 3.1 shows how the eye sensitivity changes as a function of:

- a) wavelength;
- b) lighting level (process of adaptation).

Relative Sensitivity of the Eye and Colour Bands



Wavelength λ/nm	V_λ	Wavelength λ/nm	V_λ	Wavelength λ/nm	V_λ
360	0.000004	520	0.710000	680	0.017000
370	0.000012	530	0.862000	690	0.008210
380	0.000039	540	0.954000	700	0.004102
390	0.000120	550	0.994950	710	0.002091
400	0.000396	560	0.995000	720	0.001047
410	0.001210	570	0.952000	730	0.000520
420	0.004000	580	0.870000	740	0.000249
430	0.011600	590	0.757000	750	0.000120
440	0.023000	600	0.631000	760	0.000060
450	0.038000	610	0.503000	770	0.000030
460	0.060000	620	0.381000	780	0.000015
470	0.090960	630	0.265000	790	0.000007
480	0.139020	640	0.175000	800	0.000004
490	0.208020	650	0.107000	810	0.000002
500	0.323000	660	0.061000	820	0.000001
510	0.503000	670	0.032000	830	0.000000

Table 4.1 - Spectral Luminous Efficacy Data

In general, luminous flux = 680 x Power x Relative Eye Sensitivity.

LIGHT OUTPUT

$$\text{ie, } \Phi = 680 P_\lambda V_\lambda$$

LM

