



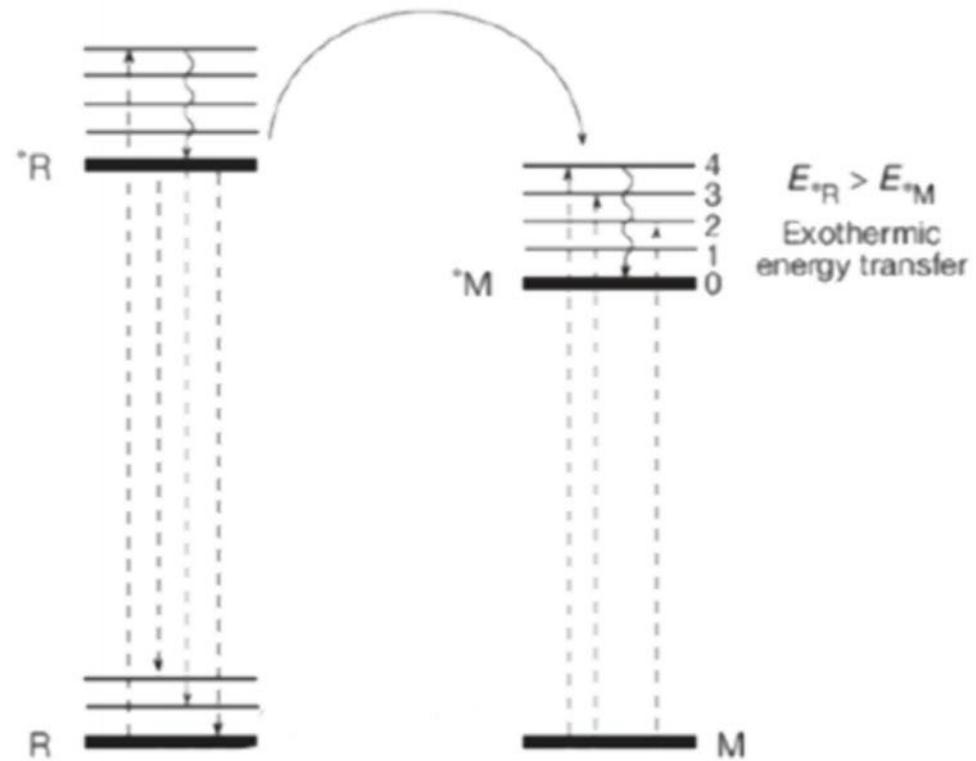
FUNDAMENTOS E APLICAÇÕES DE FOTOQUÍMICA

MODULO I: CONCEITOS FUNDAMENTAIS DE FOTOQUÍMICA

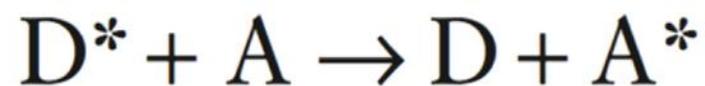
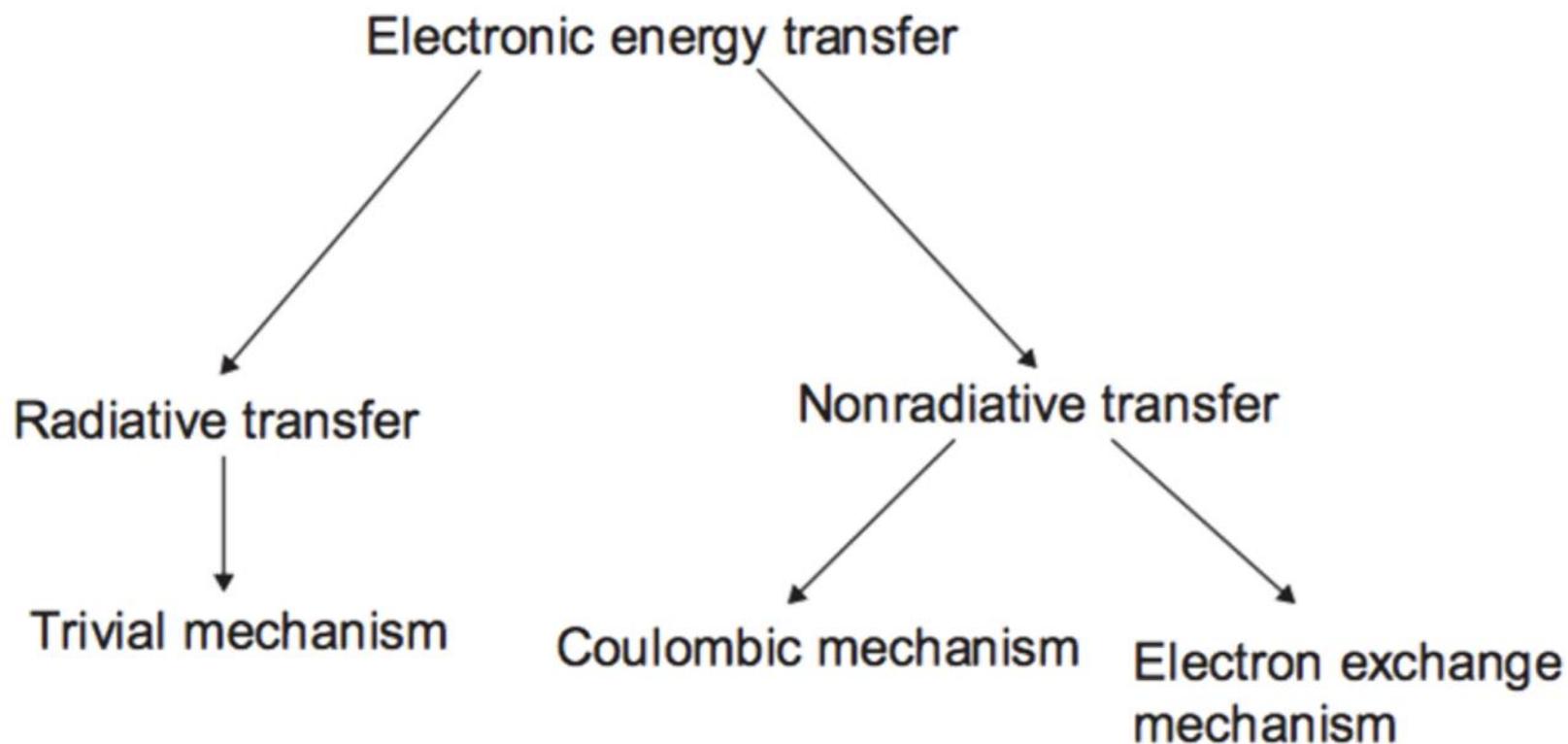
Prof. Sebastian Bello
jsbforero@gmail.com

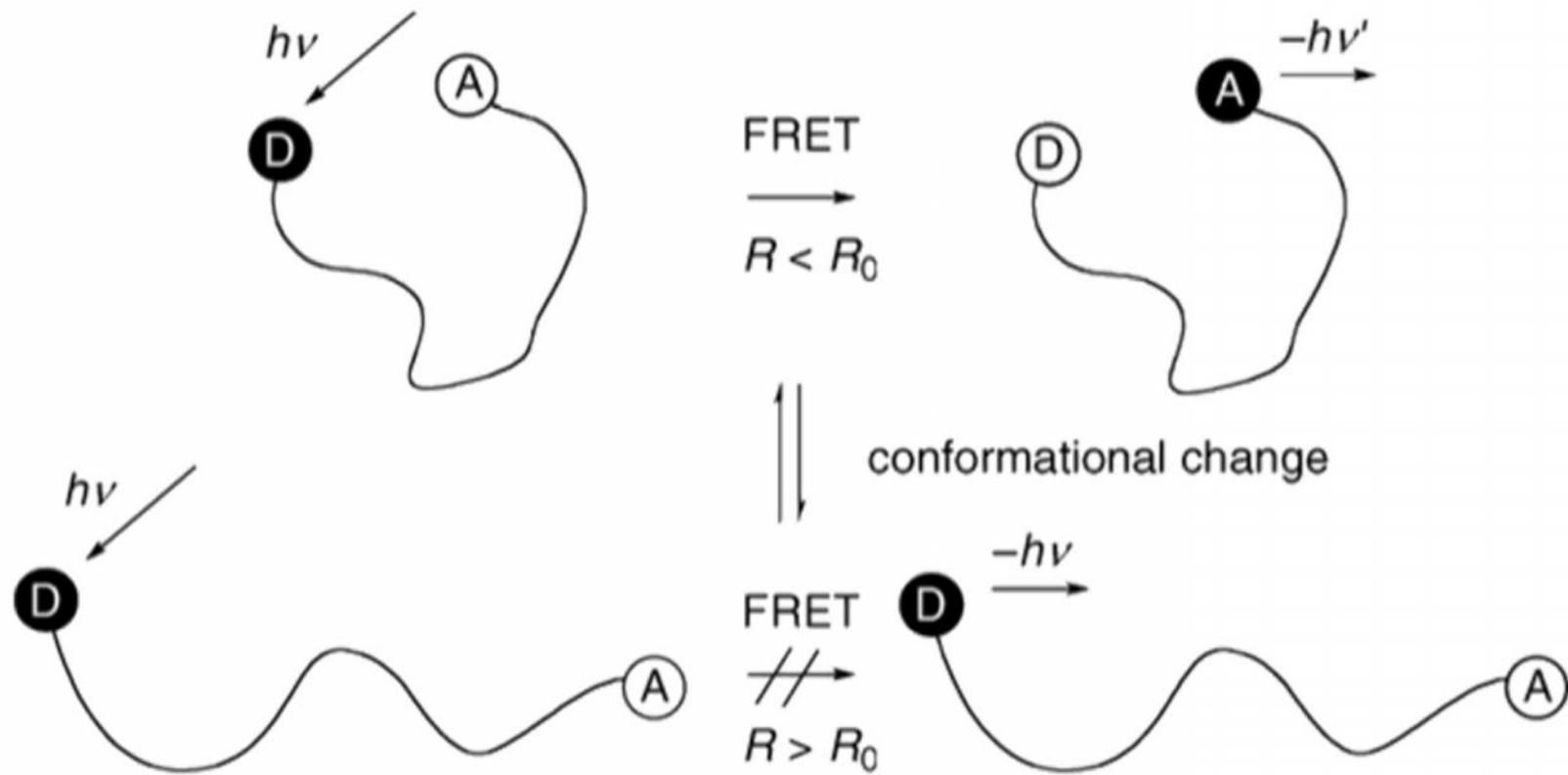
2018

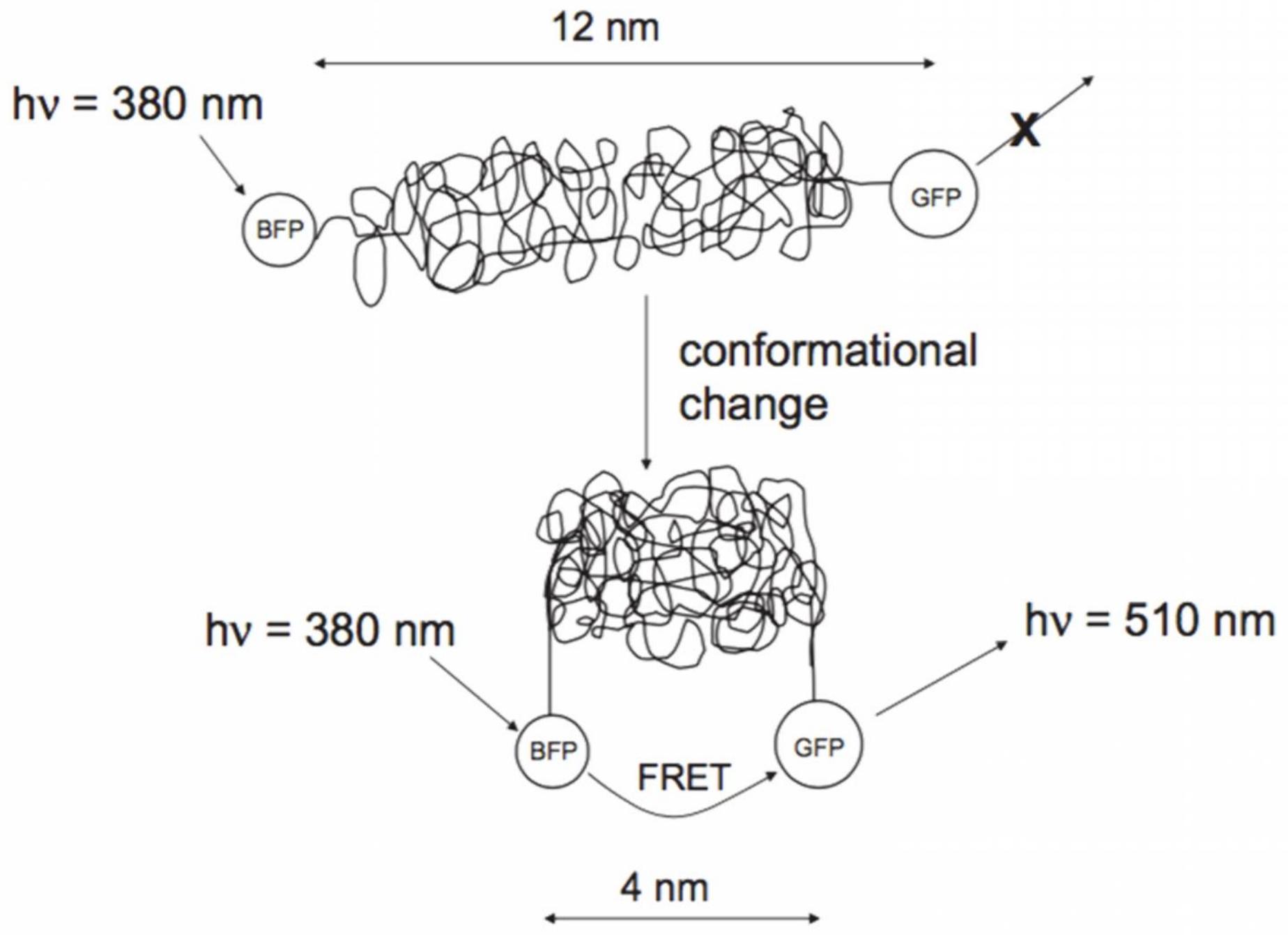
TRANSFERÊNCIA DE ENERGIA



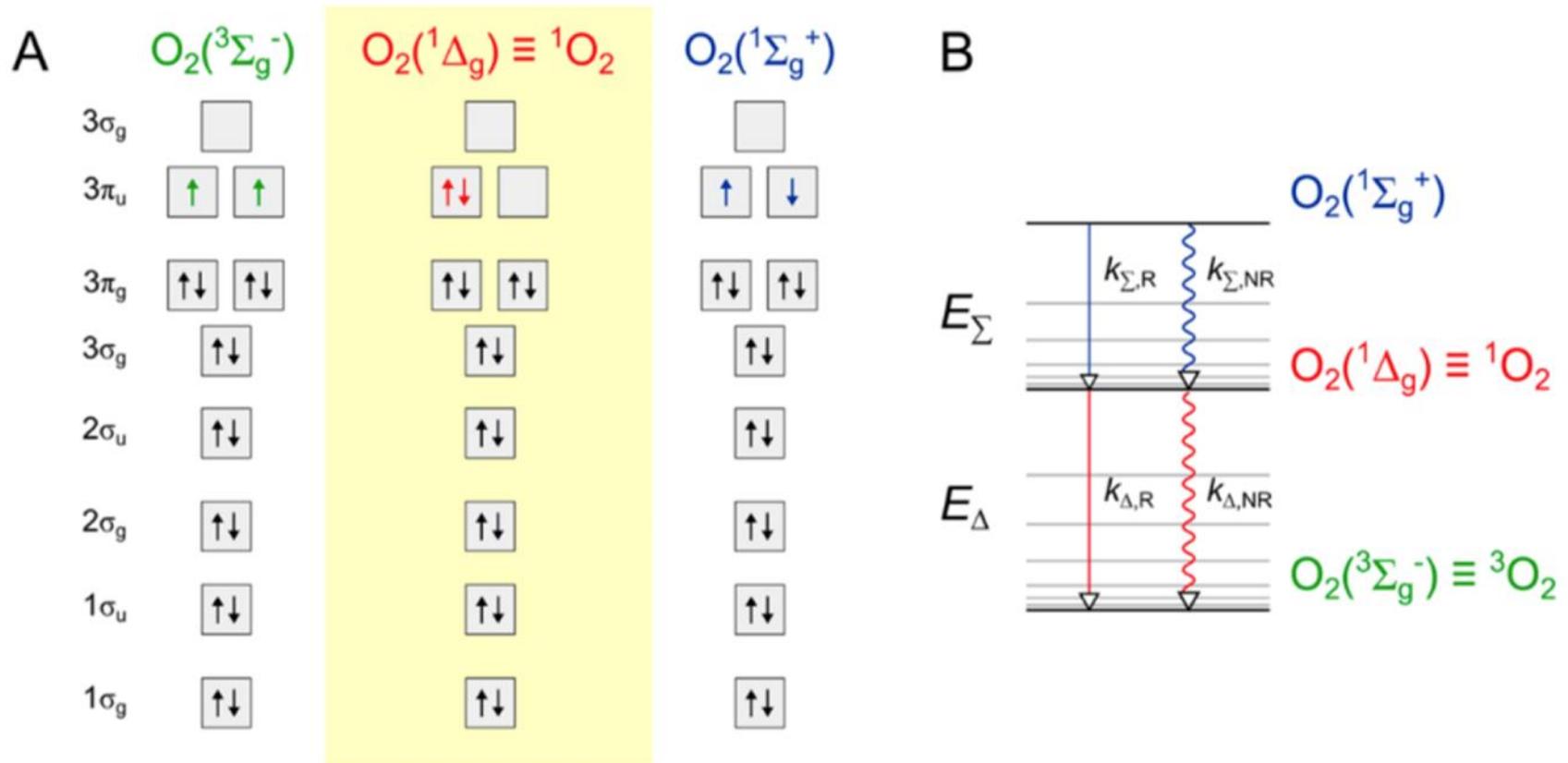
TRANSFERÊNCIA DE ENERGIA





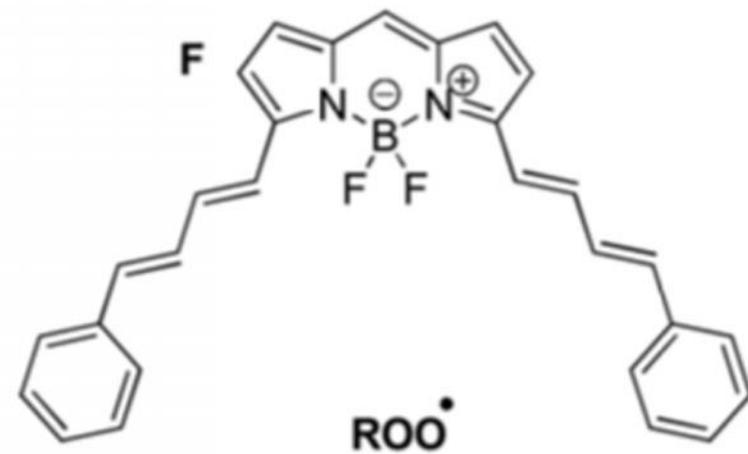
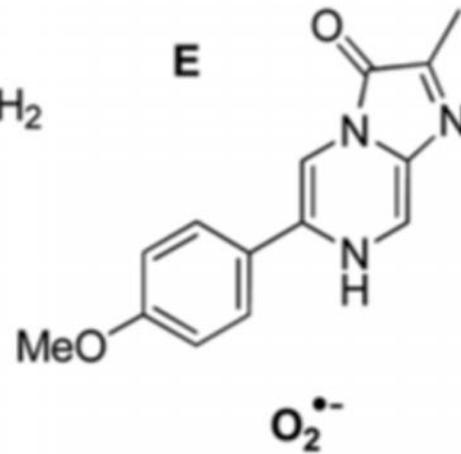
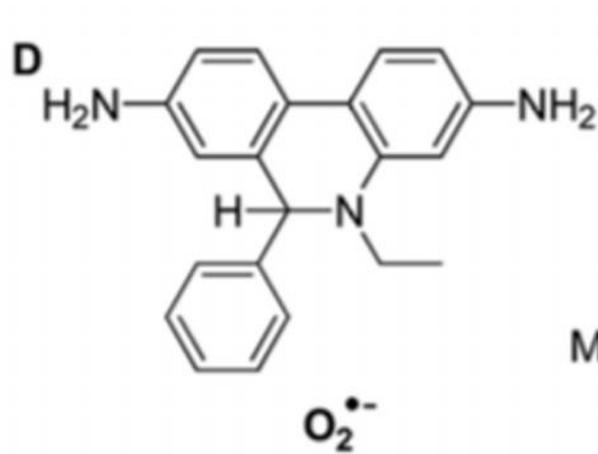
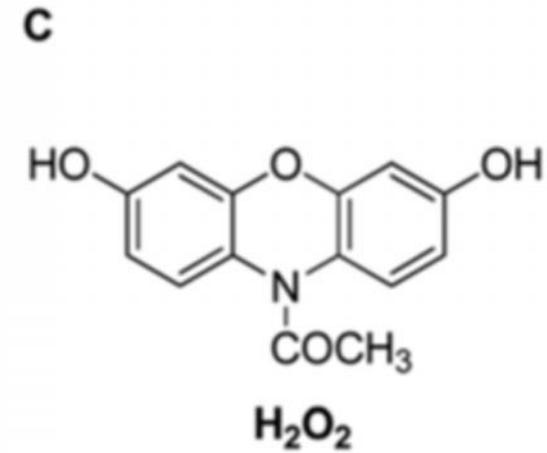
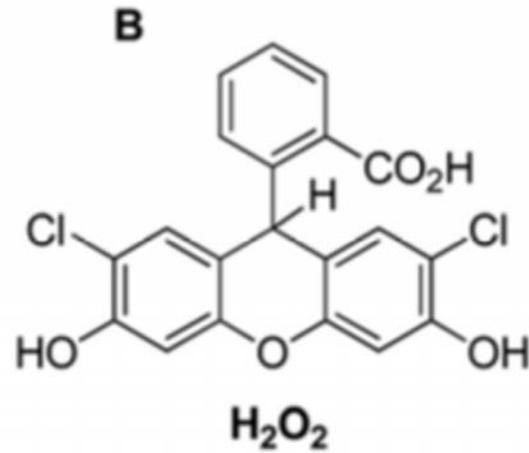
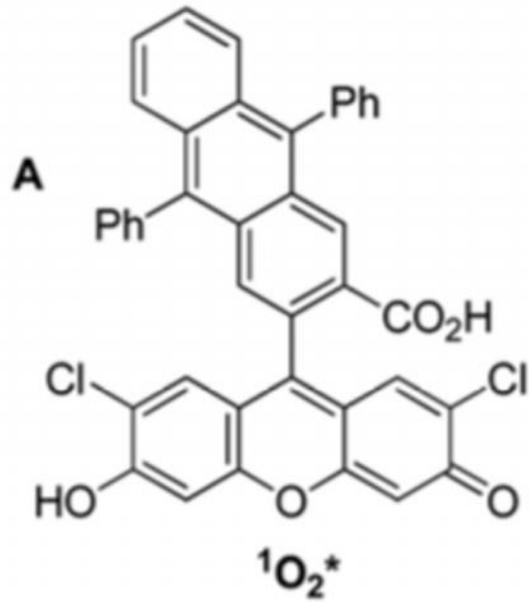


TRANSFERÊNCIA DE ENERGIA OXIGÊNIO SINGLETE



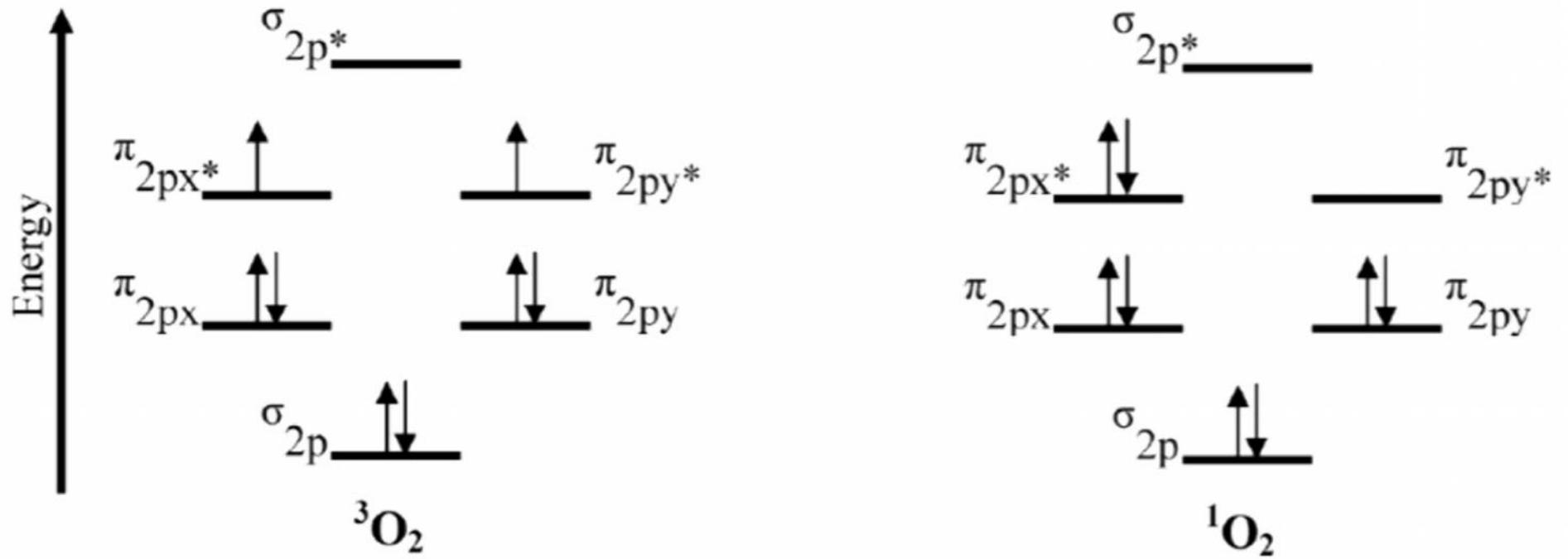
Electronic configuration of ground state molecular oxygen $O_2 (^3\Sigma_g^-)$, its first singlet excited state, $O_2 (^1\Delta_g)$ namely singlet oxygen 1O_2 , and its higher-energy singlet state, $O_2 (^1\Sigma_g^+)$. (B) Jablonsky diagram of molecular oxygen and its first singlet

SONDAS PARA ESPECIES REATIVAS DE OXIGENIO



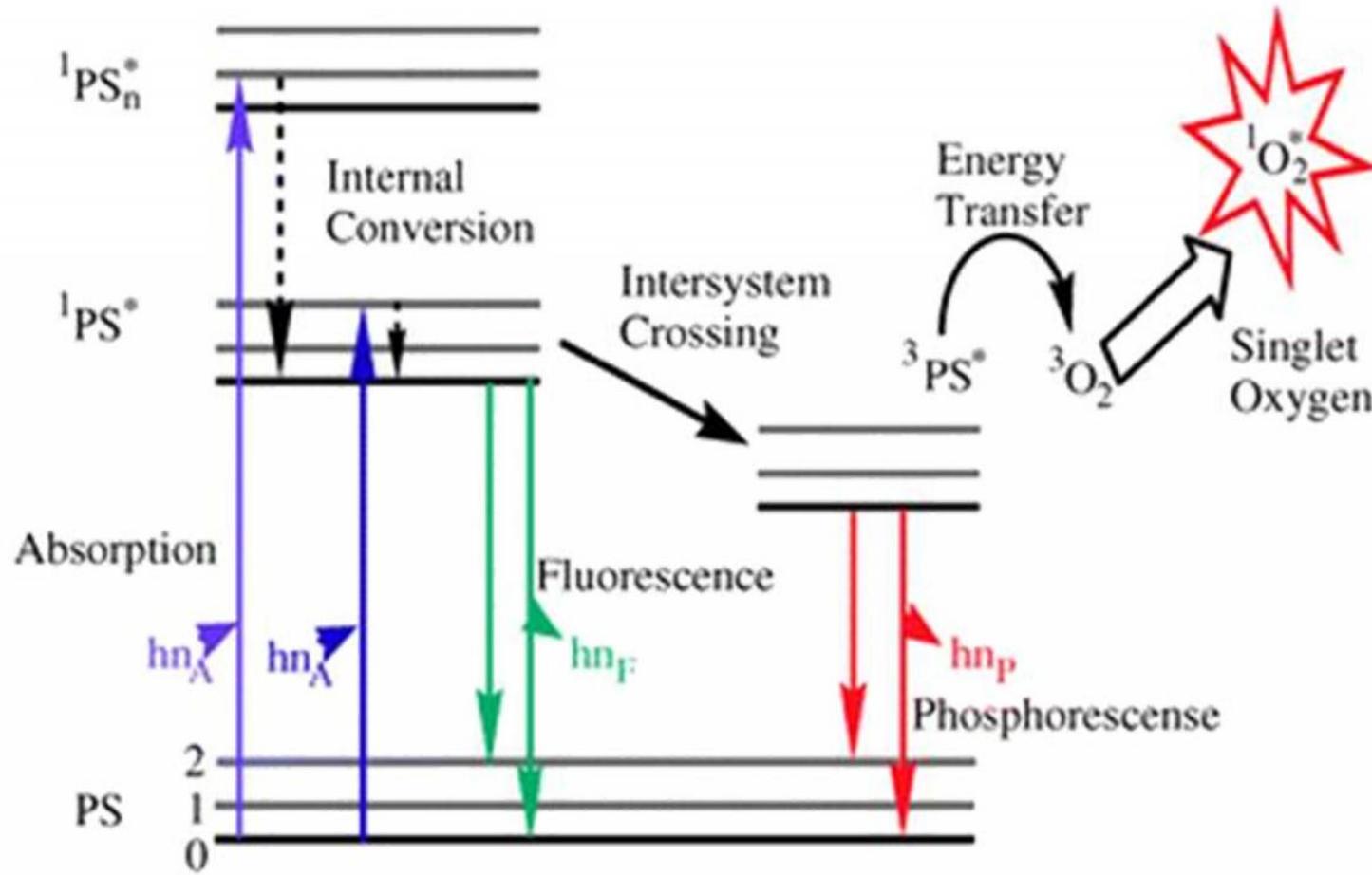
Commercial urogenic probes for sensing ROS which exert emission enhancement upon oxidation of the aromatic core

TRANSFERÊNCIA DE ENERGIA OXIGÊNIO SINGLETE



$${}^1\Delta_g = 23 \text{ kcal/mol}$$

TRANSFERÊNCIA DE ENERGIA OXIGÊNIO SINGLETE TERAPIA FOTODINÂMICA



OXIGÊNIO SINGLETE TERAPIA FOTODINÂMICA

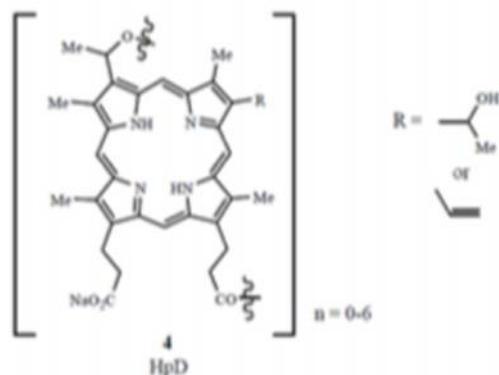


Pre-Treatment

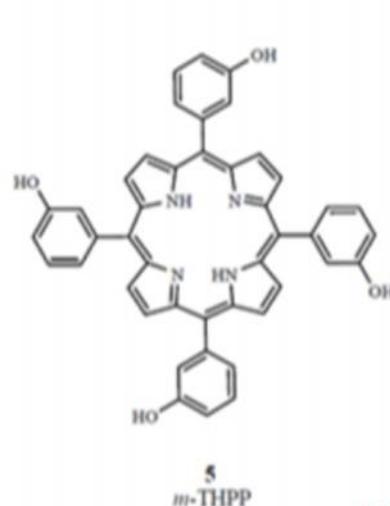
One week post-treatment

One month post-treatment

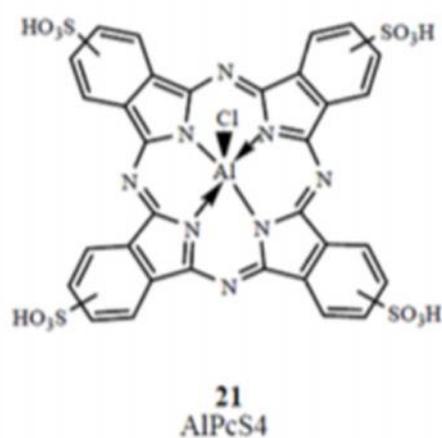
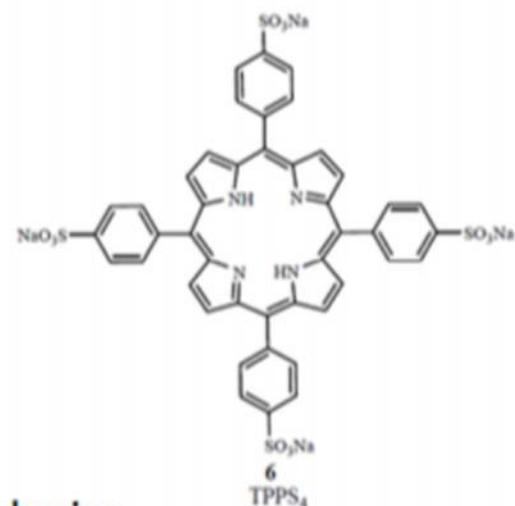
Photosensitizers for PDT



4
HpD
hematoporphyrins



porphyrins

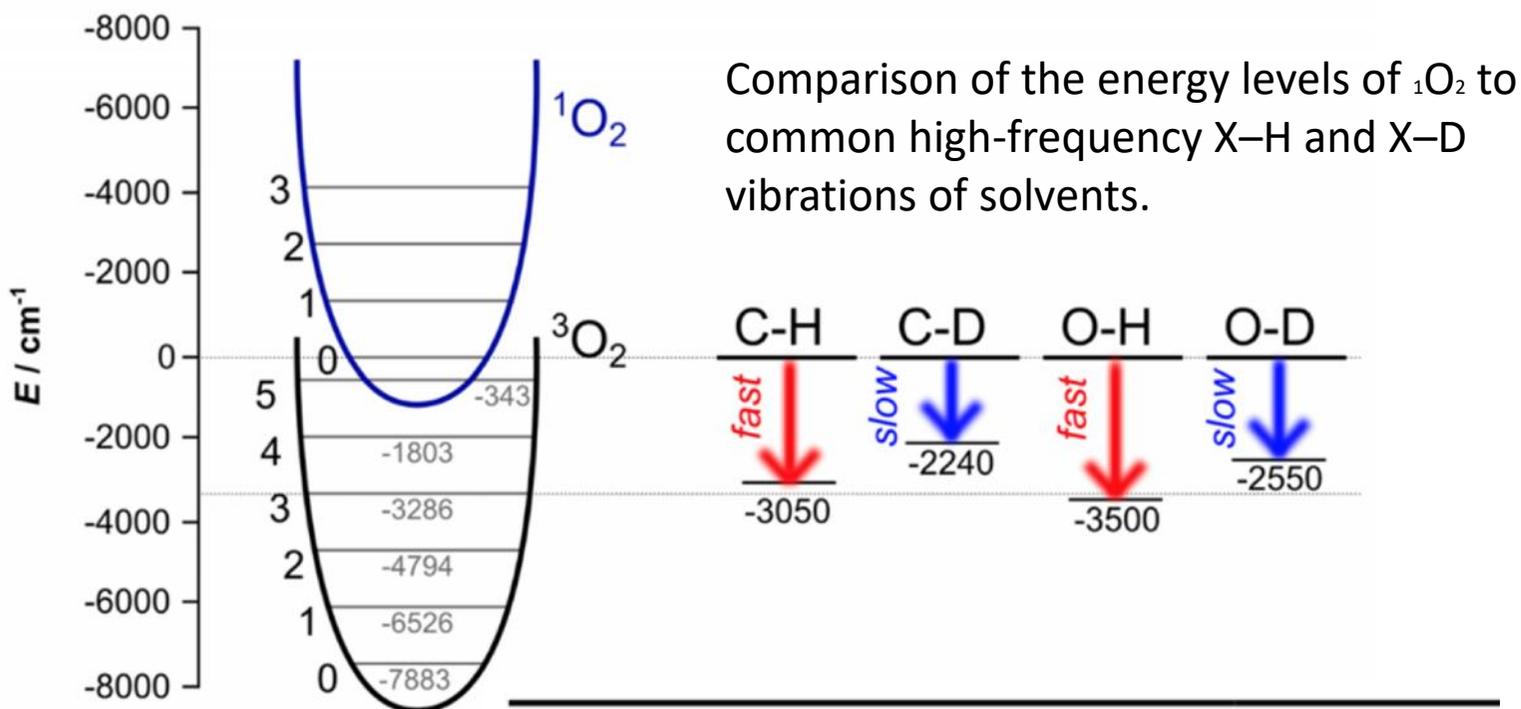


phthalocyanines

Compound	λ_{max} (nm)	ϵ_{max} ($\text{M}^{-1} \text{cm}^{-1}$)
Hypericin	590	44,000
Methylene blue	666	82,000
Toluidine blue	630	51,000
Rose bengal	549	100,000
TH9402	514	100,000
Merocyanine 540	556	110,000
Curcumin	420	55,000

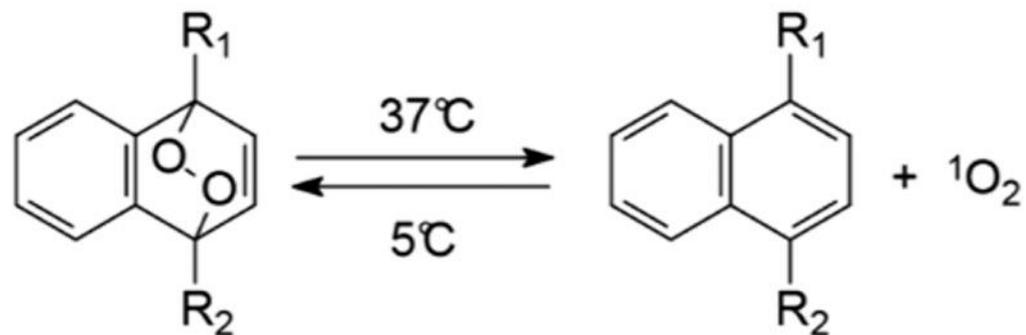
non-porphyrin compounds

TRANSFERÊNCIA DE ENERGIA.OXIGÊNIO SINGLETE



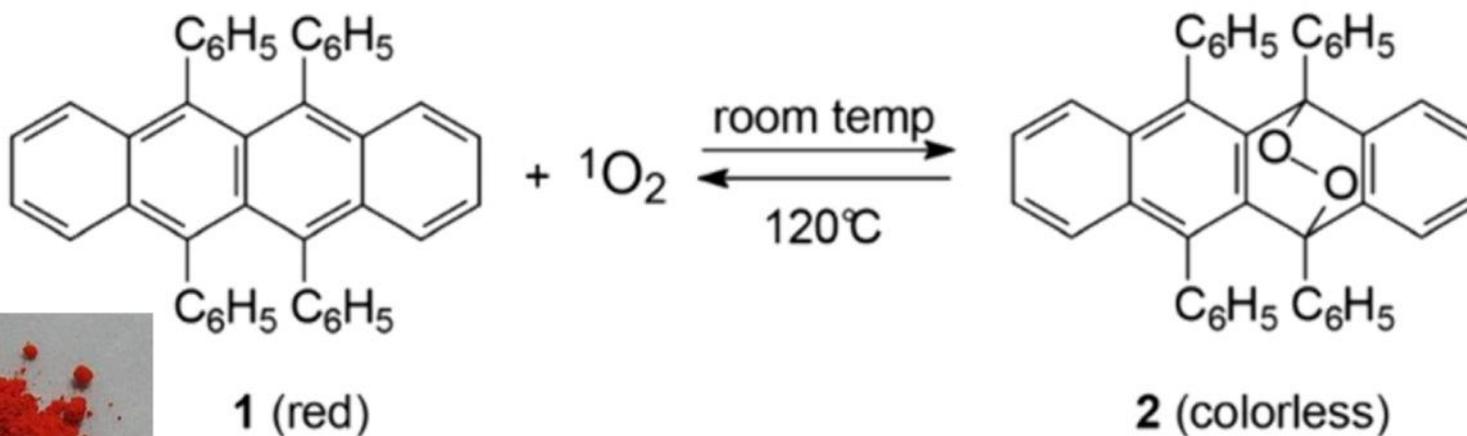
X-Y	$k_{\Delta, \text{NR}}^{\text{X-Y}}, \text{M}^{-1} \text{s}^{-1}$
O-H	2900
N-H	1530
C-H	309
O-D	132
C-D	10.4
C-Cl	0.181
C-F	0.049

TRANSFERÊNCIA DE ENERGIA. OXIGÊNIO SINGLETE

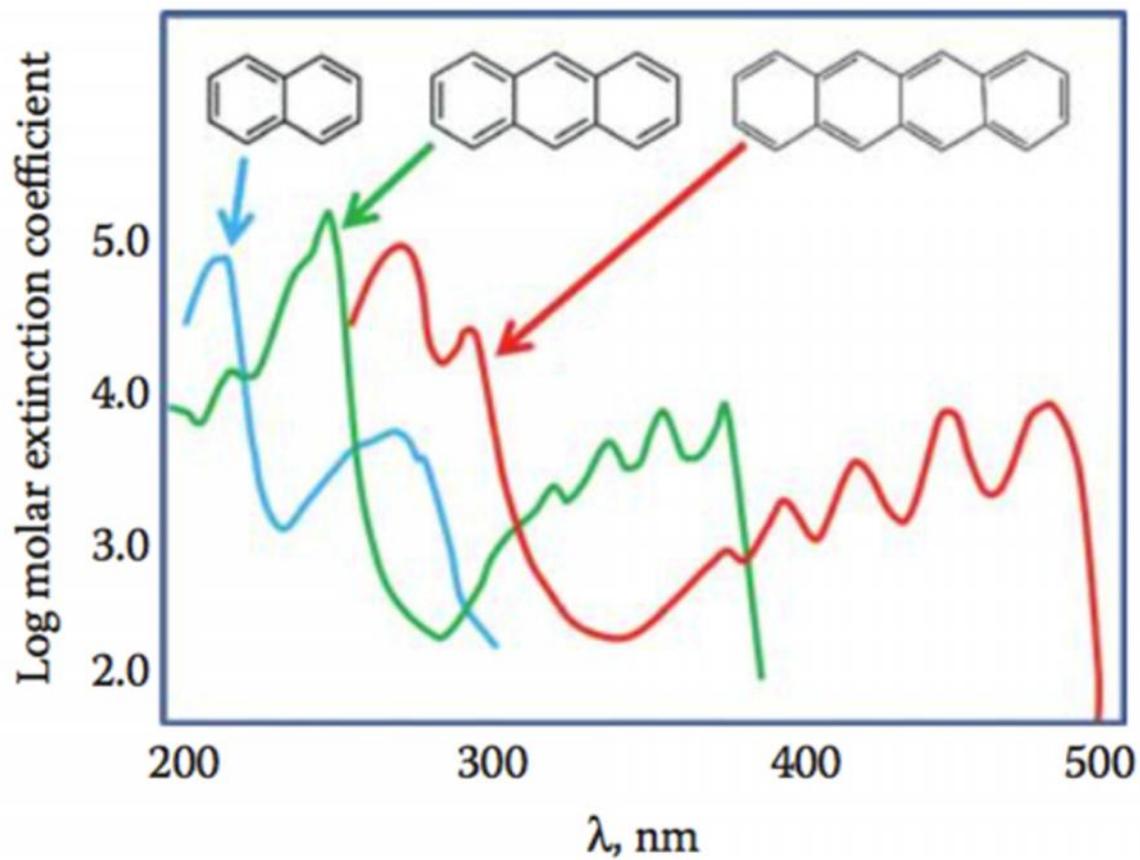


MNPO₂ and MNP: $\text{R}_1 = \text{CH}_2\text{-CH}_2\text{-CO}_2\text{Na}$, $\text{R}_2 = \text{CH}_3$

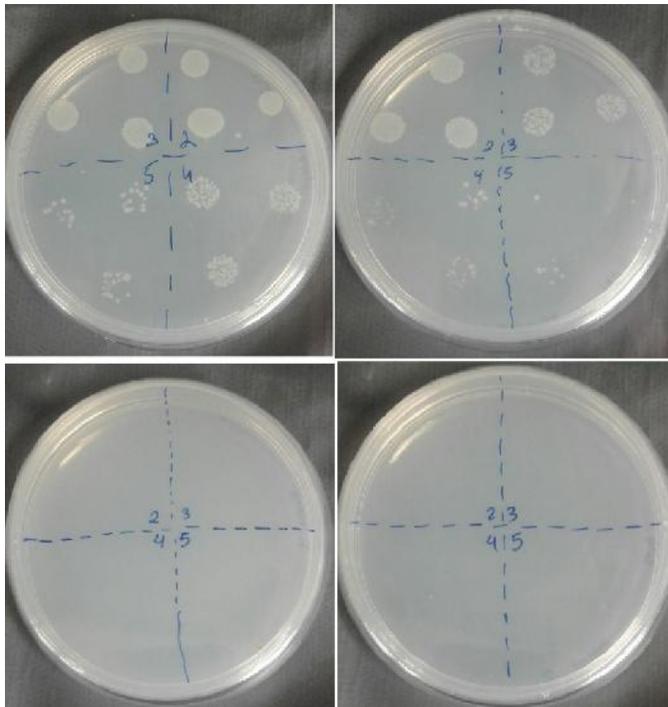
NDPO₂ and NDP: $\text{R}_1 = \text{R}_2 = \text{CH}_2\text{-CH}_2\text{-CO}_2\text{Na}$



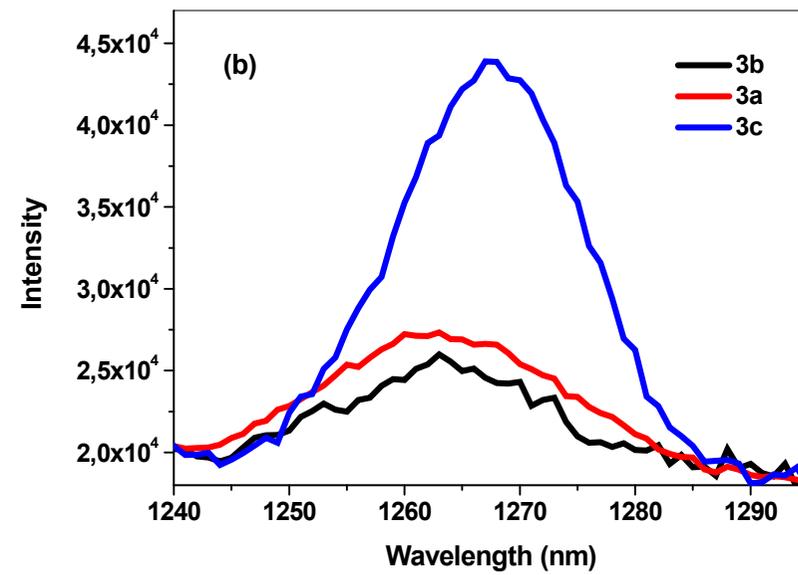
TRANSFERÊNCIA DE ENERGIA. OXIGÊNIO SINGLETE



TECIDOS DE ALGODÃO BACTERICIDAS



E. coli



Fosforescência oxigênio singlete