SNS COLLEGE OF PHARMACY AND HEALTH SCIENCES

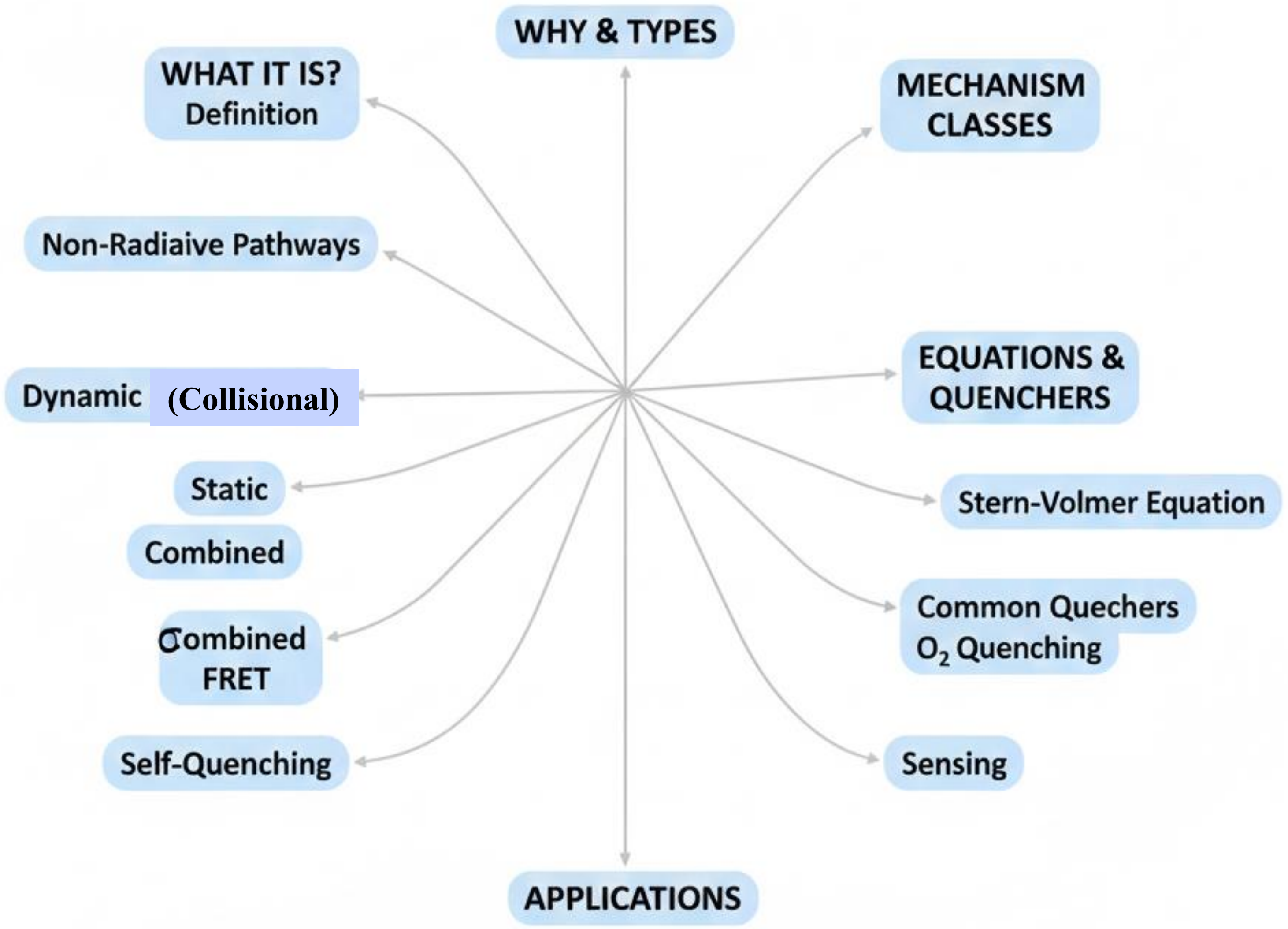
Affiliated To The Tamil Nadu Dr. MGR Medical University, Chennai
Approved by Pharmacy Council of India, New Delhi.
Coimbatore -641035

COURSE NAME: INSTRUMENTAL METHODS OF ANALYSIS (BP 701 T)

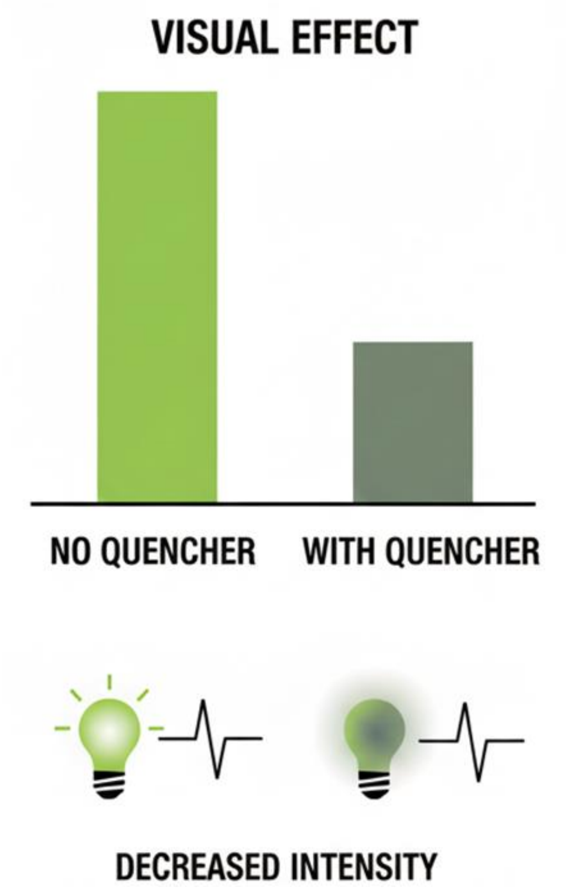
VII SEM/ IV YEAR

TOPIC 9: QUENCHING

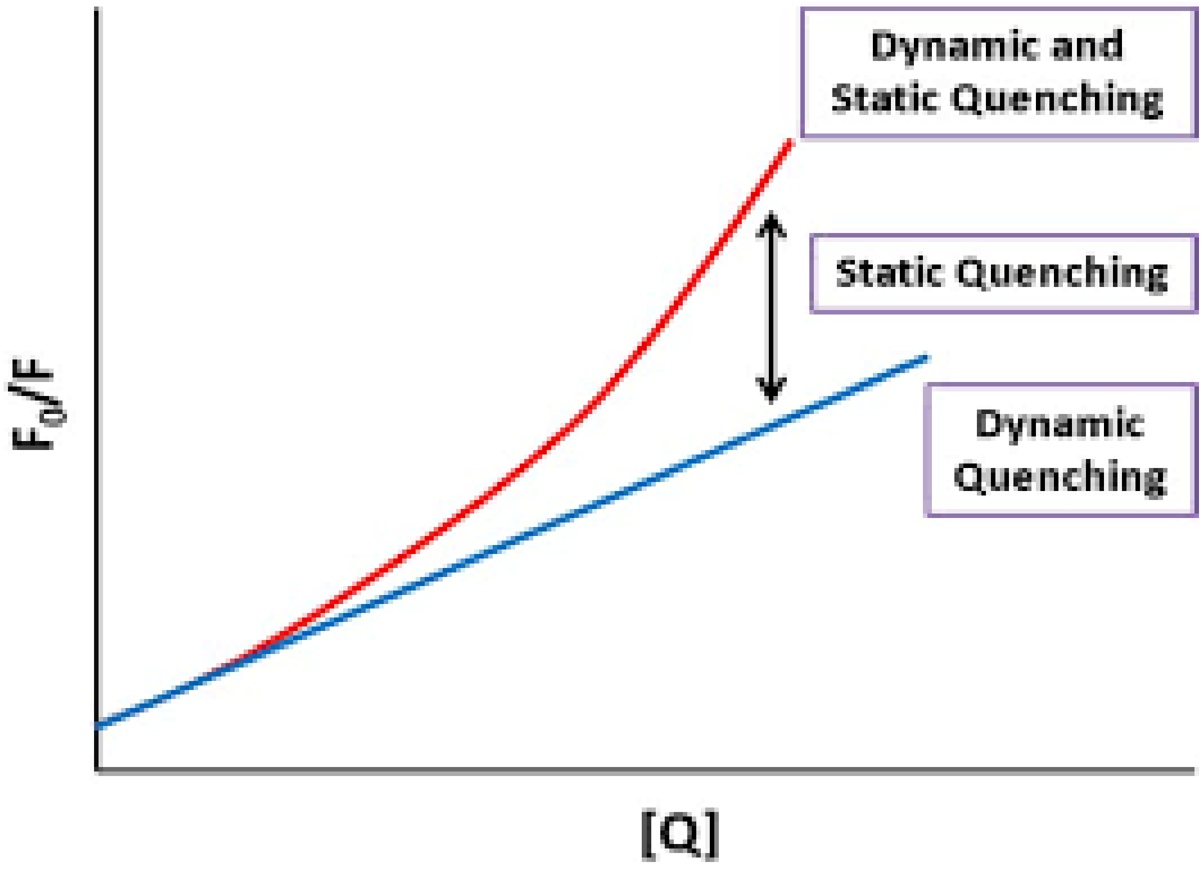
MINDMAP:


WHY & TYPES
WHAT IT IS?
Definition
MECHANISM
CLASSES
Non-Radiaive Pathways
Dynamic (Collisional)
EQUATIONS &
QUENCHERS
Static
Stern-Volmer Equation
Combined
Combined
FRET
Common Quechers
O_2 Quenching
Self-Quenching
Sensing
APPLICATIONS

Quenching

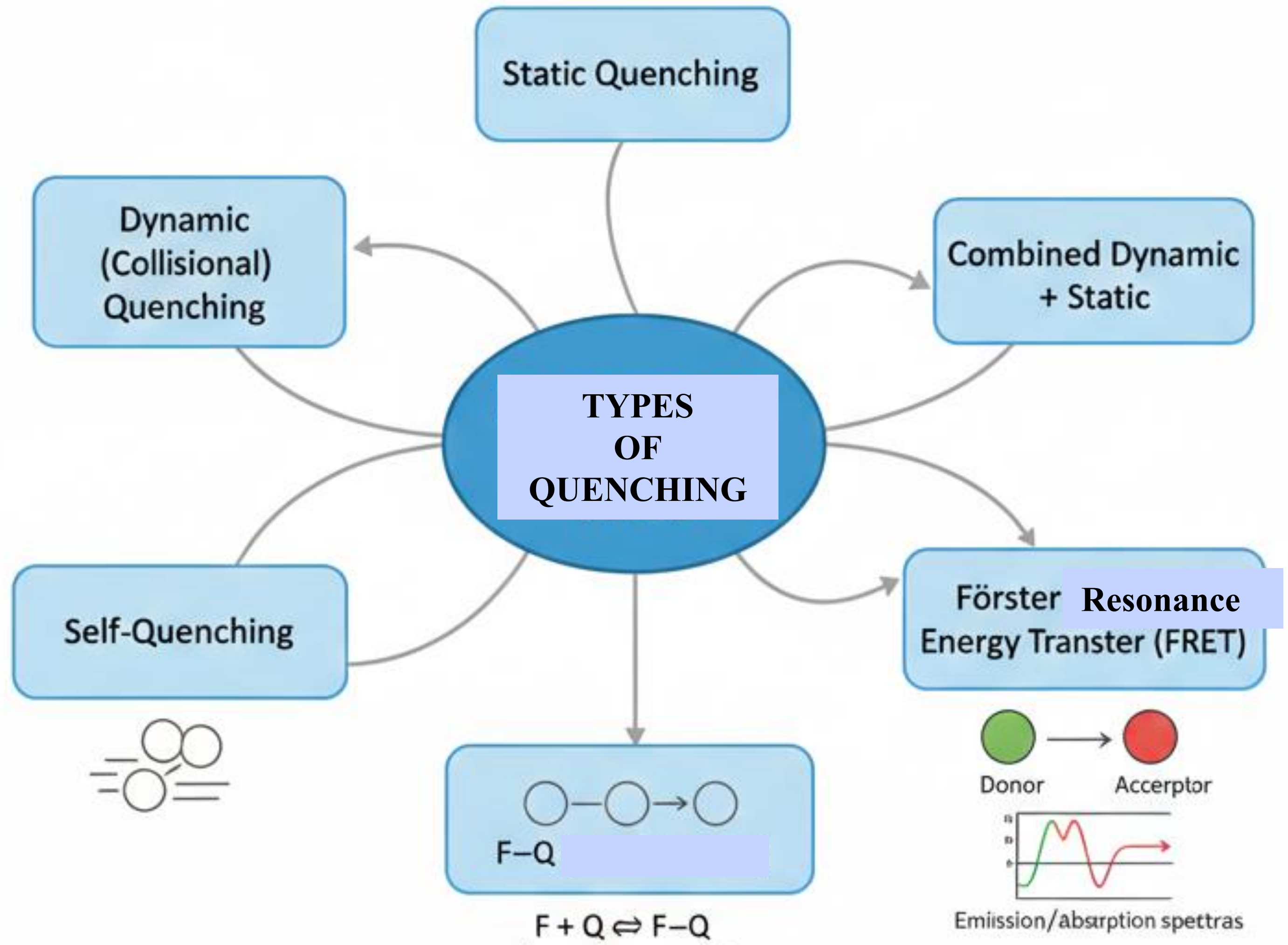


VISUAL EFFECT
NO QUENCHER
WITH QUENCHER
DECREASED INTENSITY



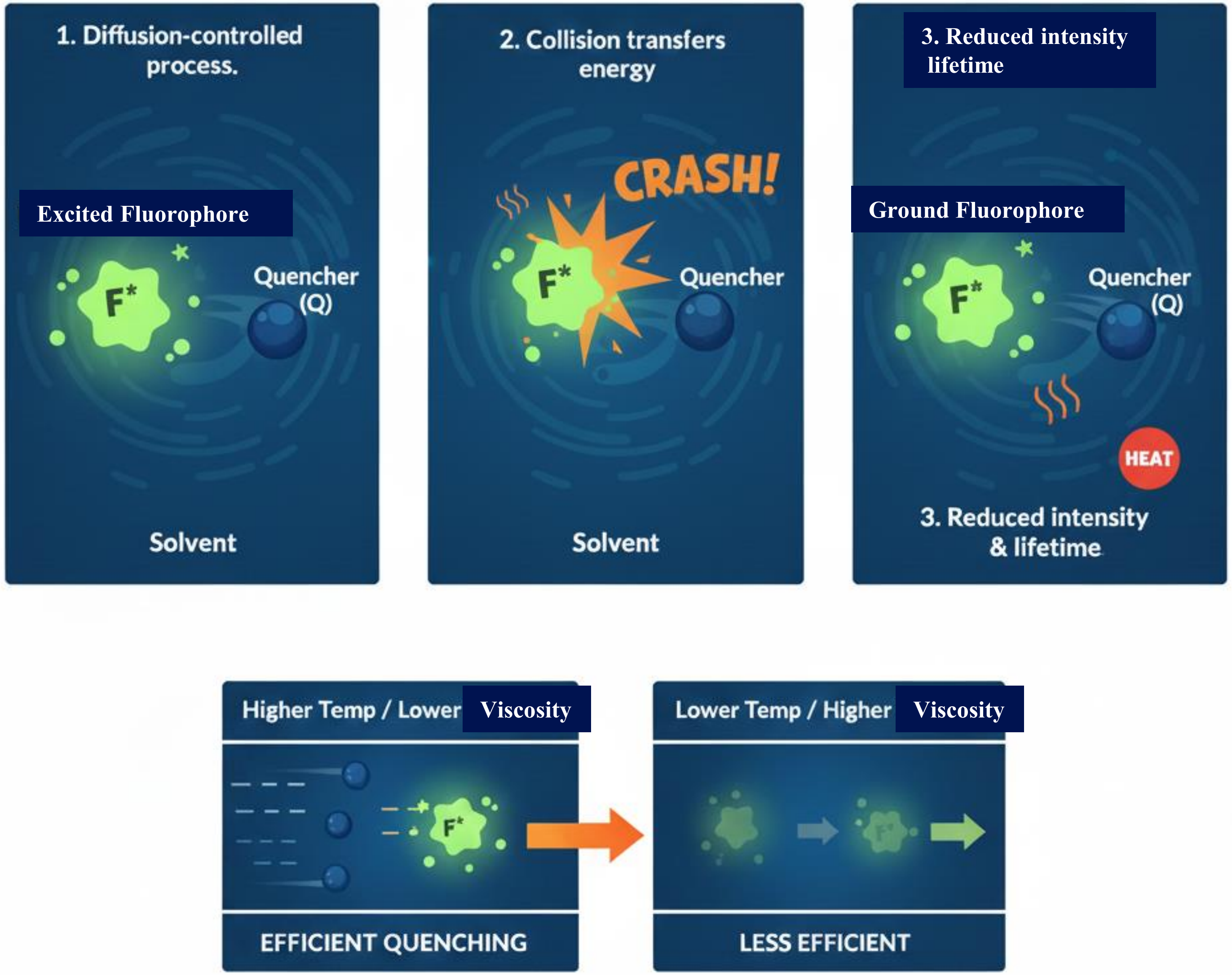
Dynamic and Static Quenching
Static Quenching
Dynamic Quenching
F_0/F
[Q]

Types of Quenching

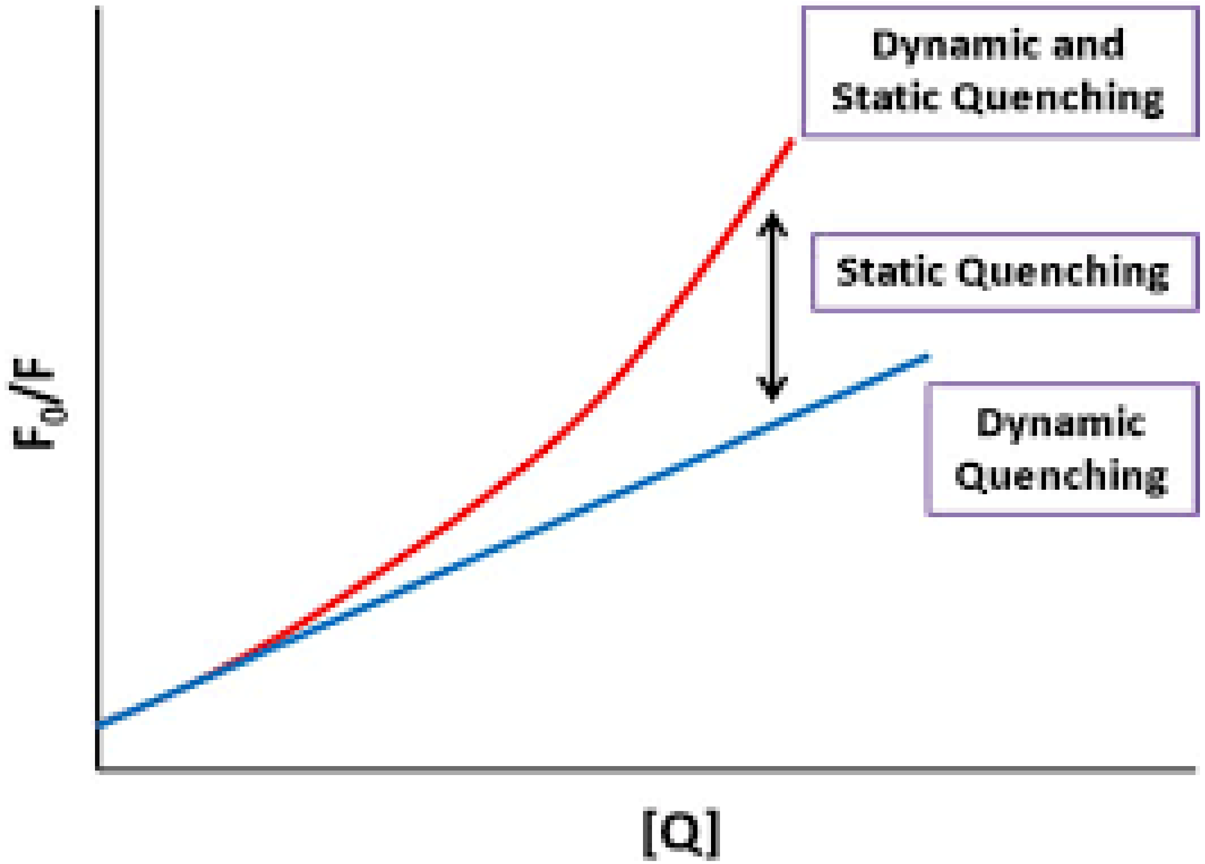


(Non-fluorescenet)

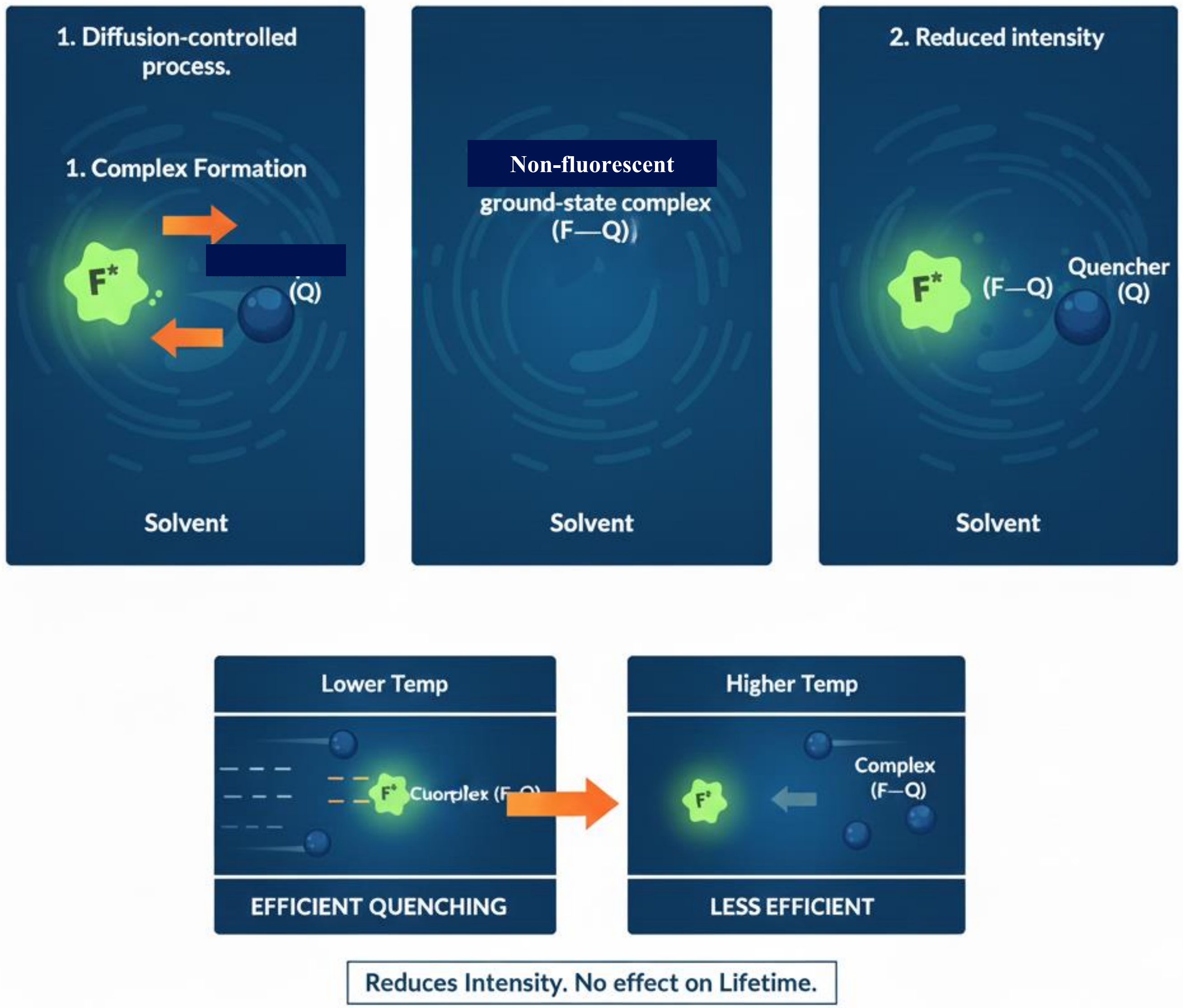
Dynamic (Collisional) Quenching



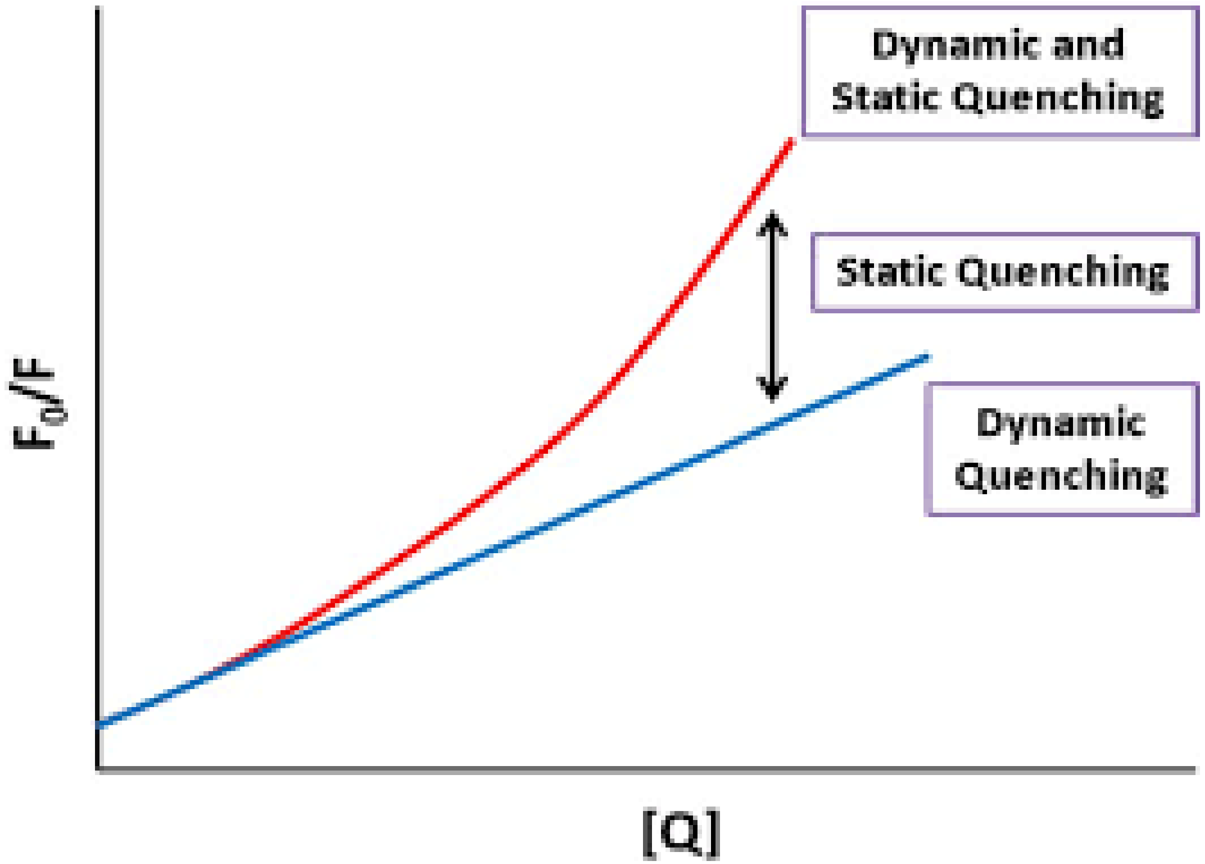
Stern-Volmer Equation – Dynamic Quenching



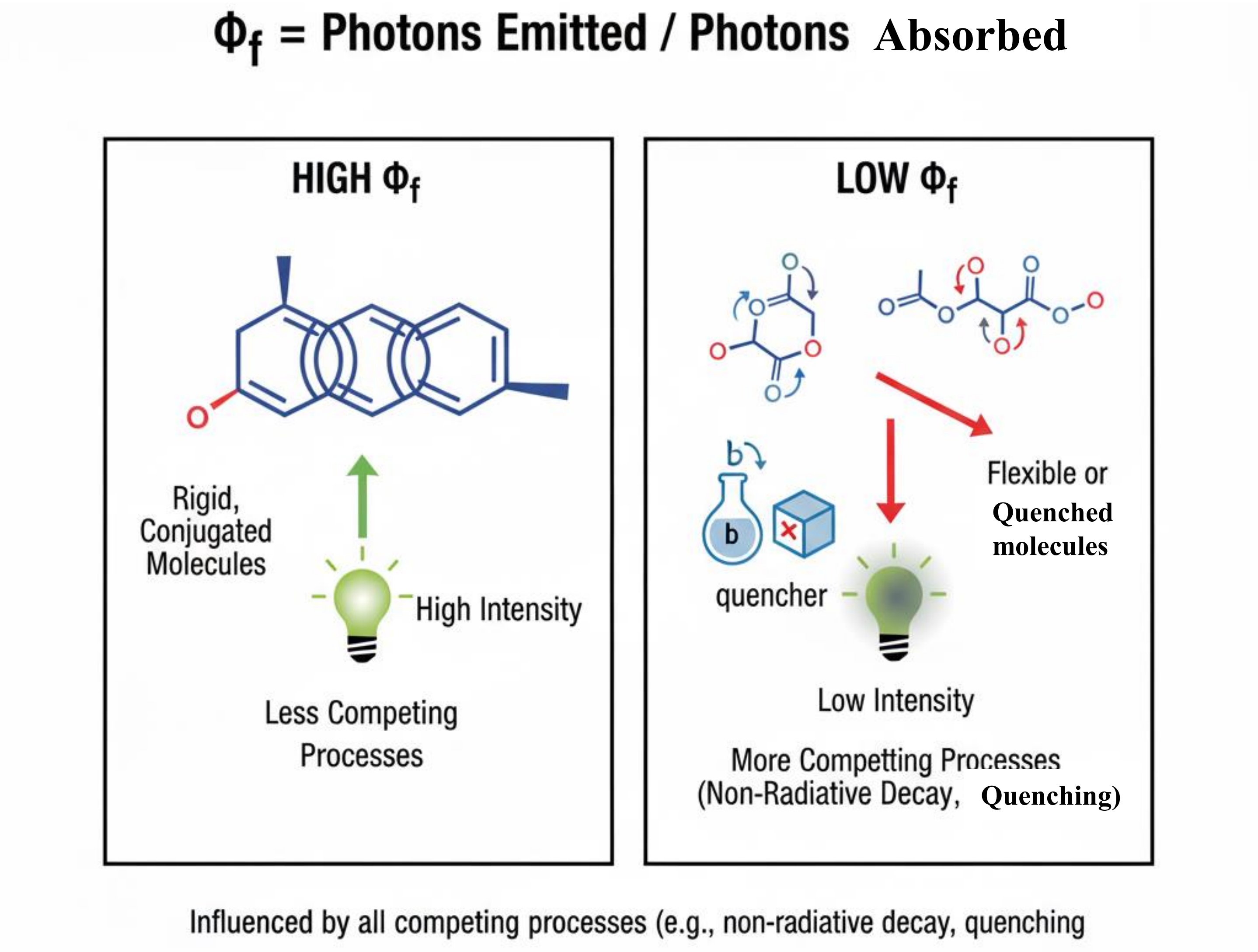
Static Quenching



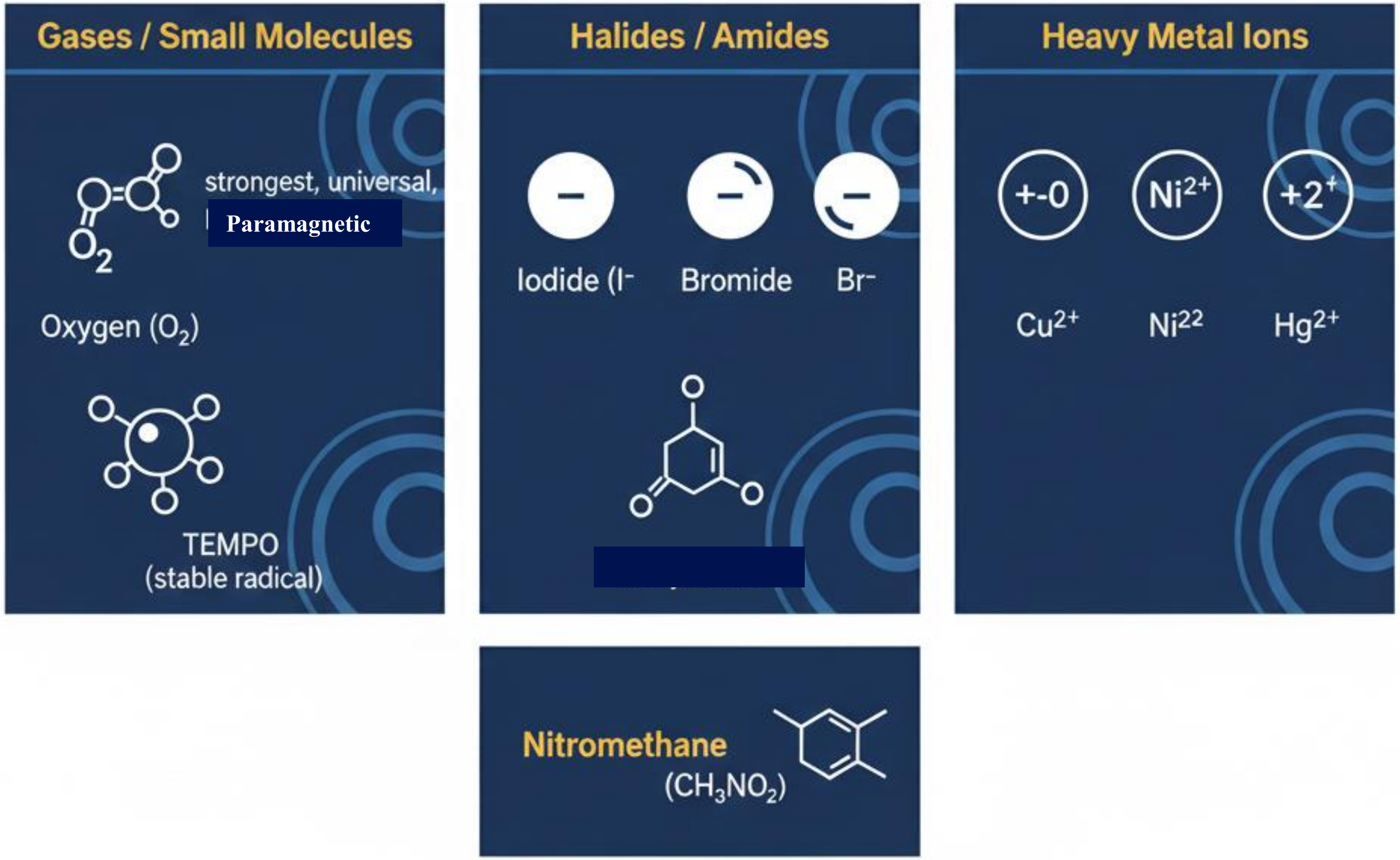
Stern-Volmer Equation – Static Quenching



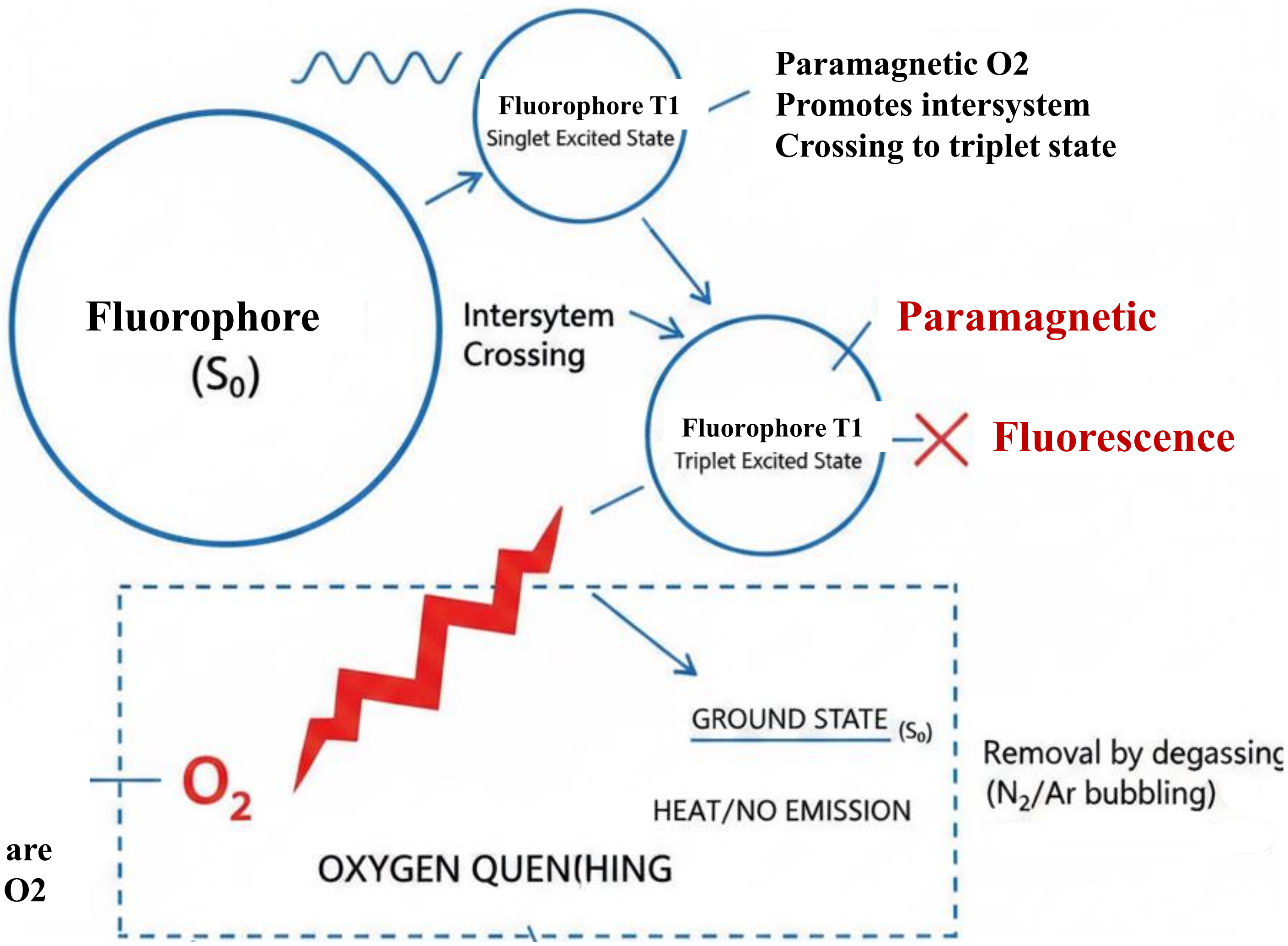
Quantum Yield (Φf)



Common quenchers



Oxygen Quenching

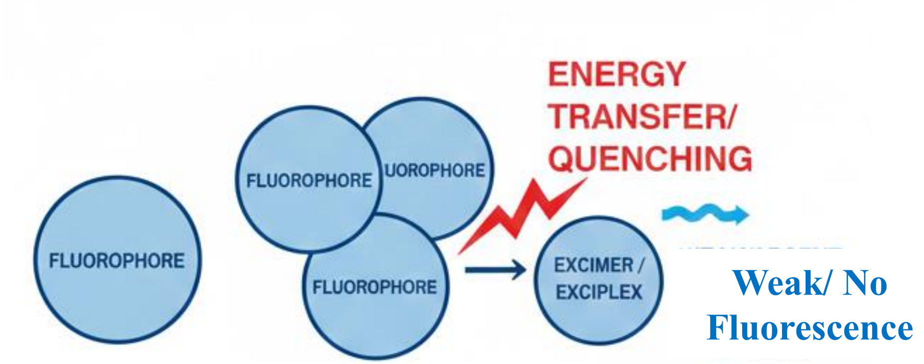


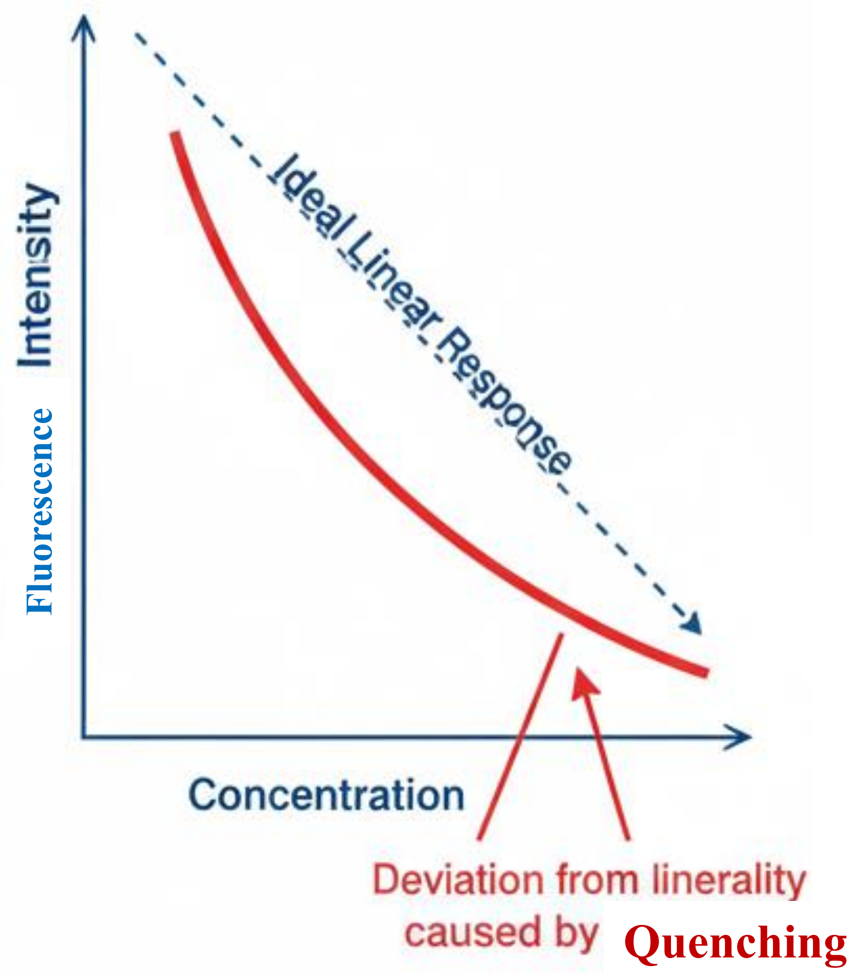
Almost all organic fluorophores are quenched by O2

Self/ concentration quenching

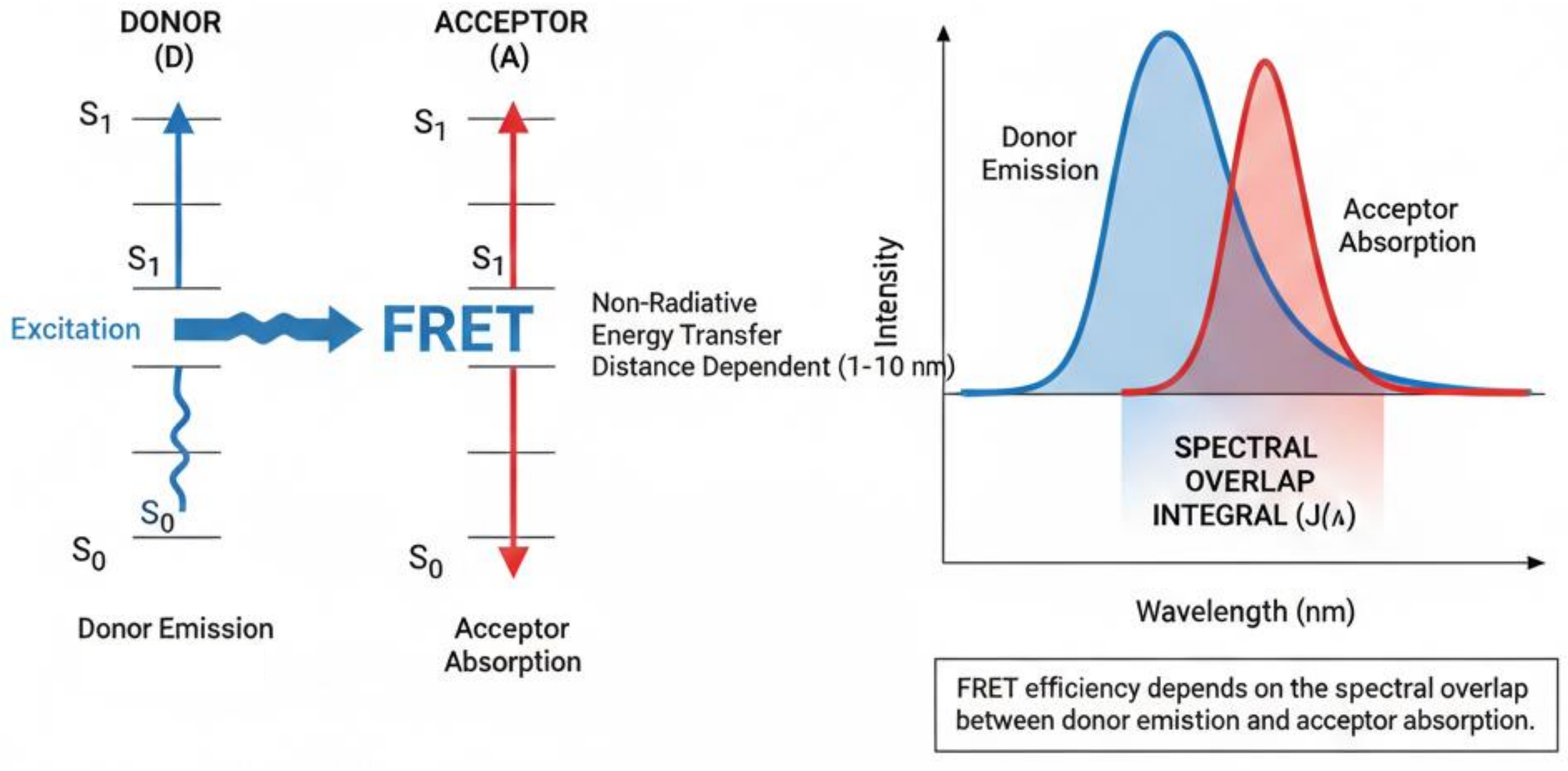
Low Concentration

High Concentration

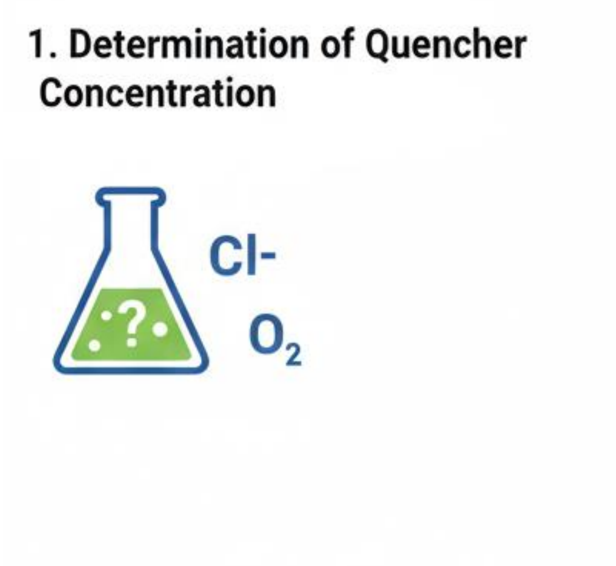




Förster Resonance Energy Transfer (FRET)

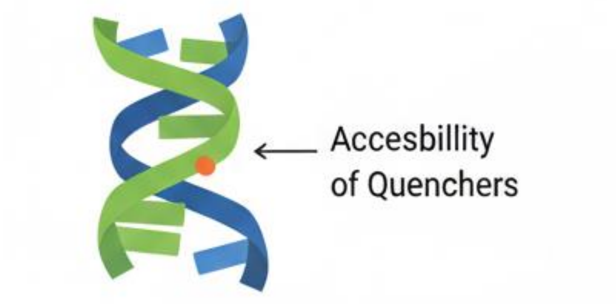


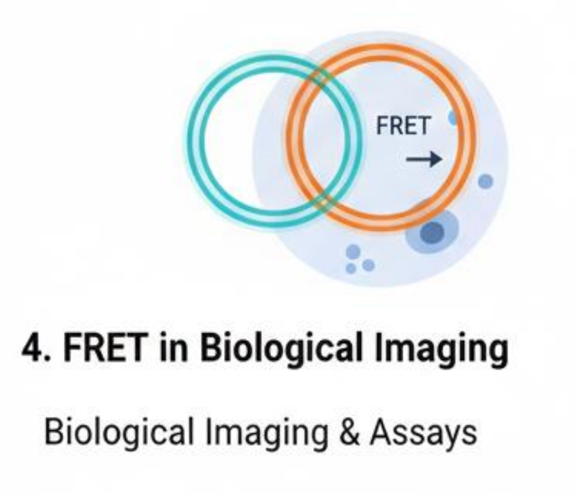
Applications



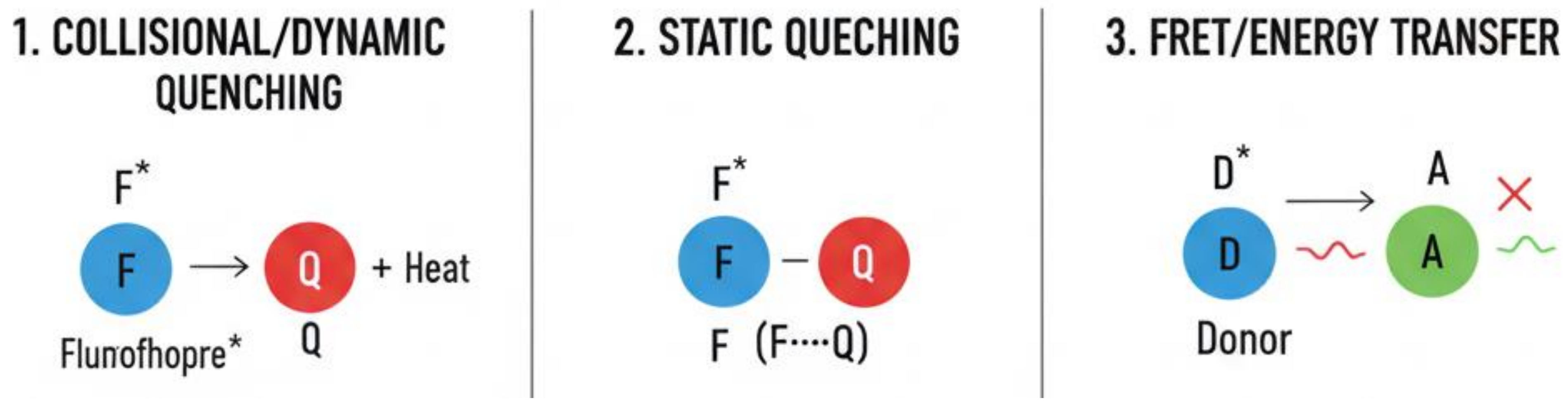
2. Flourescent based sensors

3. Protein conformation studies





Summary



1. COLLISIONAL/DYNAMIC QUENCHING
F*
F
Q
+ Heat
Flunofhopre*
Q
2. STATIC QUECHING
F*
F
Q
F (F····Q)
3. FRET/ENERGY TRANSFER
D*
A
D
A
Donor

Assessment

1. Fluorescence of phenol is stronger in:

Assessment

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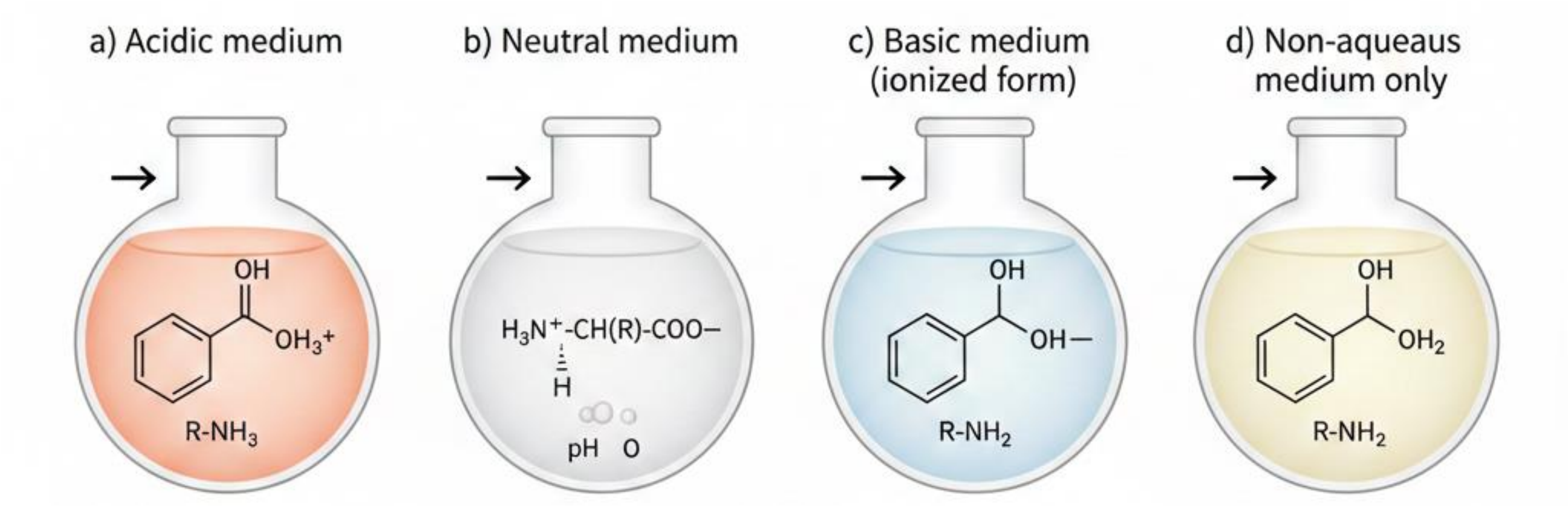

Assessment

2. In polar protic solvents, the emission spectrum of a fluorophore often shows:

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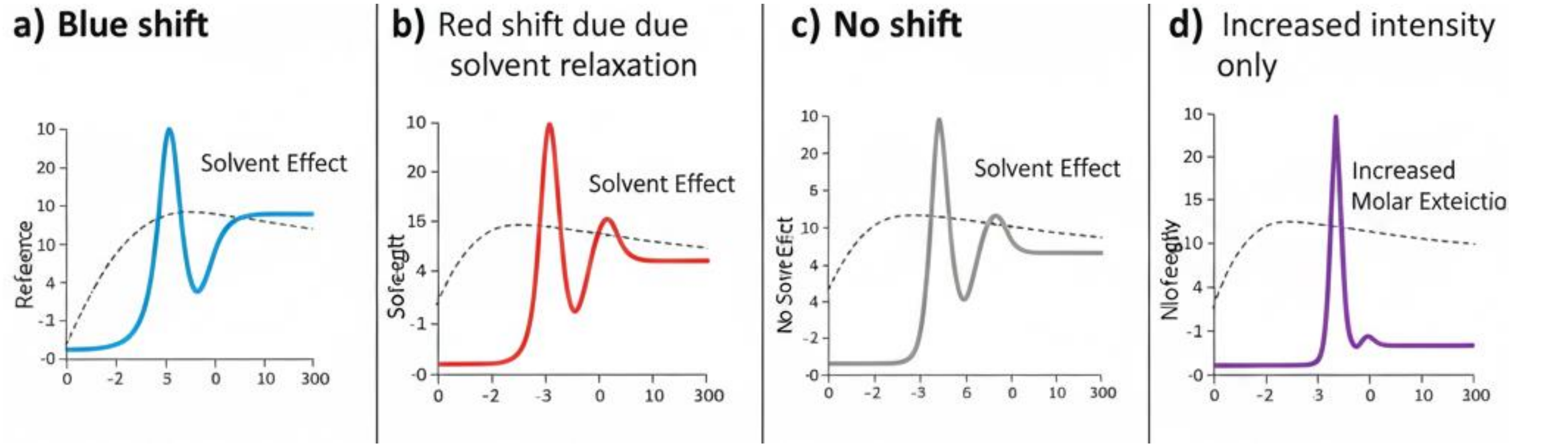

Assessment

3. Which factor does NOT typically cause quenching?

Assessment

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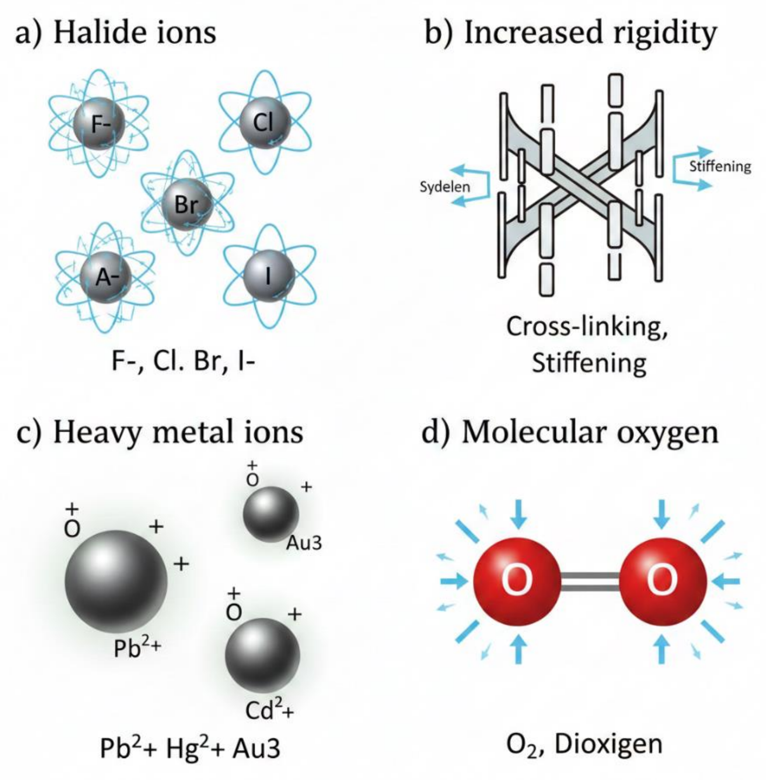

References

1. Lakowicz JR. Principles of fluorescence spectroscopy. 3rd ed. New York (NY): Springer; 2006.
2. Skoog DA, Holler FJ, Crouch SR. Principles of instrumental analysis. 7th ed. Boston (MA): Cengage Learning; 2018.
3. Guilbault GG, editor. Practical fluorescence. 2nd ed. New York (NY): Marcel Dekker; 1990.
4. Valeur B, Berberan-Santos MN. Molecular fluorescence: principles and applications. 2nd ed. Weinheim (Germany): Wiley-VCH; 2012.

Thank you!