Ain Shams University
Faculty of Science
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Photo analytical methods for the determination of some industrial potentials materials

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Approval Sheet

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Aim of the work

The aim of the present work is the development and introduction of modern analytical techniques with high sensitivity and selectivity with low cost for the determination of some materials of industrial potential by Photo analytical methods such as Nalbuphin HCl(NAL) and important enzym in human body xanthin oxidase enzyme (XO) these methods consist of

1- Nalbuphine(NAL) concentration was determined by the quenching the luminescence intensity of Tb-4'carboxybenzo-18crown-6-ether [Tb-CCE] , CCE, 4'carboxybenzo-18crown-6-ether complex at λ_{ex}= 285 nm . [Tb-CCE] complex were measured in DMF at pH 6.5. PH of the sensorThis method is simple, accurate and can successfully be applied to the determination of (NAL) in pharmaceutical preparation and in serum samples with remarkably satisfactory results.

2- A novel spectrofluorimetric probe for determining xanthin oxidase enzyme (XO) in human serum samples was established and proposed. The optimal experimental conditions of working

solvent, pH and also the concentration of Tb - pyridine-2,6-dicarboxylicacid [Tb-PDA] doped in sol gel matrix fluorescence corresponding to maximum fluorescence intensity were investigated. Under optimal conditions, the quenched fluorescence intensity of [Tb-PDA]doped in sol gel matrix is proportional to the concentration of (XO)in the range 1.4 x 10^{-8} to 5.7 $\times 10^{-5}$mol L^{-1} (r = 0.97). The detection limit (LOD) is 2.9 $\times$ 10^{-9} mol L^{-1}. This method is used for determination of (XO) in serum samples of patients.

List of Abbreviations

a	The average value for three readings
(b)	slope
(r^2)	The correlation coefficient
2S+1	The total spin multiplicity
AC	Acetaminophen
AFU	the activity of the enzyme α -1-fucosidase
Eu	sensitizer, denoted
BSE	bovine spongiform encephalopathy
2-CNP	2-chloro-4-nitrophenol
CCE	4'carboxybenzo-18crown-6-ether
CF	Caffeine
CL	Confidence limit
CRAB	cetyltrimethylammonium bromide
dpa	2,6-dipicolinate
DELFIA	Dissociation Enhanced Lanthanide Fluorescence Immunoassay
Df	dilution factor
DMF	Dimethyl Formamide
DMSO	Dimethyl sulfo oxide
ED	Electric dipole
EIS	electrochemical impedance spectroscopy
EDFA's	Erbium (III) doped fiber amplifiers
EDTA	Ethylene diamine tetra acetic acid
EPR	electron paramagnetic resonance
ET	The energy transfer efficiency
Eu	Erbium
ETT	The triplet state energy is transferred to the lanthanide ion
FE	Fluorescence emission
F_0	the luminescence intensities in the absence of the quencher
F	the luminescence intensities in the presence of the quencher

GAGs	glycosaminoglycans
GC	Gas chromatography
Hx	hypoxanthine
HPLC	High performance liquid chromatographic
HS6B-XO	heparin-Sepharose 6B
HTRF	homogeneous time-resolved fluorescence
HCC	Hepatitis Chronic Cirrhosis
ISC	The intersystem crossing quantum yield
K_D	the Stern-Volmer constant
K_q	the bimolecular quenching constant
K_s	the association constant for complex formation
J	The total angular momentum
L	The orbital angular momentum
Ln(III)	Trivalent lanthanide ions
LOD	Limit of detection
LOQ	Quantitation limits
MD	Magnetic dipole
MOF	morphine
MRI	Magnetic resonance imaging
MS	Mass spectroscopy
N	Number of measurement
NA	Noradrenaline
NAL	Nalbuphin HCl
NAT	naltrexone
NIR	Near infrared
NMR	Nuclear magnetic resonance
PET	photo-induced electron transfer
PDA	pyridine-2,6-dicarboxylic acid
[Q]	the concentration of quencher
QC	Quantum cutting
R.S.D	Relative standard deviation

RE	Relative error
S	Standard deviation
S_0	The ground state
S_1	The singlet excited state
S2	the second singlet state
SET	Singlet energy transfer
[Sm^{+3}-DC]	samarium (III) –doxycycline
SPE	Solid-phase extraction
τ_0	the lifetime of the fluorophore in the absence of quencher
T_1	Triplet state
Tb	Terbium
Tb- CCE	Terbium-4'carboxybenzo-18crown-6-ether
Tb-PDA	Terbium- pyridine-2,6-dicarboxylic acid
TEOS	Tetra Ethoxy Silane
TOPO	tri-n-octyl phosphine oxide
TLC	thin-layer chromatography
UA	uric acid
UC	Up conversion
U/L	Xanthin oxidase activity
UPLC-MS/MS	Ultra performance liquid chromatography–tandem spectrometry method
UV-Visible	Ultraviolet –visible
VIS	Visible light
WHO	World Health Organization
X	xanthine
$\overline{X}$	Average was taking for three readings by three analysts
XO	xanthine oxidase enzym
Yb	Ytterbium
ZnS: Ag	zinc sulfide doped with silver ions
ΔA	difference absorbance
μ	The molar absorptivity
μ_E	dipole moment in the excited state
μ_G	dipole moment in the ground state
Φ	Quantum yields

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