

RIHEL FATMA ZOHRA (génie des procédés _ procèdes organique)

Partie 1 :

Étape 1

Thème : Synthèse et caractérisation de nouvelles sondes fluorescences hybrides organo-métalliques.

J'ai d'abord rédigé un premier paragraphe sans utiliser d'outils d'intelligence artificielle.

La synthèse organique représente l'étape clé dans le développement de sondes fluorescentes hybrides organo-métalliques, en se concentrant sur la synthèse des dévelopeurs des nouveaux protocoles de synthèse, de nouvelles séries de composés hétérocycliques aux propriétés fluorescentes intrinsèques , utilisant à la fois des techniques conventionnelles (reflux thermique, agitation à froid) et non conventionnelles (micro-ondes, Ultrason).Cette approche sera poursuivie dans le but d'obtenir de nouvelles séries hybrides : organo-métalliques par complexation avec des métaux afin d'améliorer leurs propriétés fluorescentes afin de combiner ces deux types de composés pour créer des sondes fluorescentes. L'objectif final est de développer des sondes qui sont des outils extrêmement polyvalents et très puissants. Grâce à leur capacité à imager et à analyser des systèmes complexes, elles jouent un rôle essentiel dans de nombreux domaines d'application tels que la physique, la biologie, la chimie, le diagnostic médical et l'analyse environnementale, en permettant un suivi précis de processus complexes.

Étape 2 – REFORMULER & STRUCTURER

Prompt utilisé :

Reformule ce paragraphe dans un style académique clair et structuré.

Version reformulée (ChatGPT)

La synthèse organique constitue une étape clé dans le développement de sondes fluorescentes hybrides organo-métalliques. Ce travail se concentre sur l'élaboration de nouveaux protocoles de synthèse permettant l'obtention de nouvelles séries de composés hétérocycliques présentant des propriétés fluorescentes intrinsèques. Ces composés seront synthétisés en utilisant à la fois des techniques conventionnelles, telles que le reflux thermique et l'agitation à froid, ainsi que des méthodes non conventionnelles, notamment l'irradiation micro-ondes et les ultrasons.

Cette approche vise également la préparation de nouvelles séries de composés hybrides organo-métalliques par complexation avec des ions métalliques, dans le but d'améliorer leurs propriétés fluorescentes. La combinaison des systèmes organiques et métalliques permettra ainsi la conception de sondes fluorescentes performantes. L'objectif final est de développer des outils analytiques polyvalents et puissants, capables d'imager et d'analyser des systèmes complexes. Ces sondes trouvent des applications majeures dans divers domaines tels que la physique, la biologie, la chimie, le diagnostic médical et l'analyse environnementale, en permettant un suivi précis de processus complexes.

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Poser une question

Joindre

Rechercher

Étudier

Créer l'image

Voix

Étape 3 – Correction grammaticale (Grammarly) :

Après vérification à l'aide de Grammarly, aucune faute grammaticale n'a été détectée et le score de correction linguistique obtenu est de 100 %.

The screenshot shows the Grammarly AI Chat interface. At the top, there's a navigation bar with icons for home, file, and settings, followed by 'Untitled doc', 'Try Pro for \$0', 'Share', and a three-dot menu. On the right, there's a sidebar with various icons for AI features like proofreading, writing analysis, and communication. The main area displays a message from Grammarly: 'Hi rihel, I can help you create the best version of your writing. Get started by adding some text to the doc.' Below this, a card shows 'Grammarly Proofreader' with a 'Writing quality' score of 100, accompanied by a green progress bar. A note says 'Get tailored suggestions to improve your writing in Grammarly Proofreader.' At the bottom, there's a button labeled 'Ask AI' and a small 'T' icon. The central text area contains the reformulated paragraph from Step 2.

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Étape 4 – TRADUIRE français-anglais (DeepL)

Organic synthesis is a key step in the development of organometallic hybrid fluorescent probes. This work focuses on the development of new synthesis protocols for obtaining new series of heterocyclic compounds with intrinsic fluorescent properties. These compounds will be synthesized using both conventional techniques, such as thermal reflux and cold stirring, and unconventional methods, including microwave irradiation and ultrasound.

This approach also aims to prepare new series of organometallic hybrid compounds by complexation with metal ions, with the goal of improving their fluorescent properties. The combination of organic and metallic systems will thus enable the design of high-performance fluorescent probes. The ultimate goal is to develop versatile and powerful analytical tools capable of imaging and analyzing complex systems. These probes have major applications in various fields such as physics, biology, chemistry, medical diagnostics, and environmental analysis, enabling accurate monitoring of complex processes.

The screenshot shows the DeepL Agent interface. At the top, a banner says "DeepL Agent est là ! Faites connaissance avec votre nouveau collègue IA et transformez votre façon de travailler." Below the banner, the DeepL logo is on the left, followed by navigation links: "Produits" (with a "nouveau" badge), "Solutions", "Tarifs", "Applications", "Connexion", and a large button "Commencer l'essai gratuit". The main content area has two language dropdowns: "français (langue détectée)" and "anglais (américain)". The text in French discusses the synthesis of hybrid organic-metallic fluorescent probes, mentioning various synthetic methods like thermal reflux and microwave irradiation. The corresponding English translation is provided below. On the right side, there's a sidebar titled "Outils de modification" (Modification tools) with options like "Niveau de formalité" (Formality level), "Clarify", "Personnalisations" (Personalizations), "Glossaires" (Glossaries), "Règles de style" (Style rules), and "Modèle linguistique" (Language model). Below the sidebar, there are social sharing icons and a page number "1253 / 1500".

Part 2 :

1/ The Research Question:

What are the recent protocols for the synthesis of hybrid organic–metallic fluorescent probes and what are their applications?

2/ Initial Exploration with Elicit :

The results I found with Elicit.

The screenshot shows the Elicit platform interface. At the top, there are navigation links: "Elicit", "Recents", "Library", "Alerts", and a user profile "RIHEL Fatma Zohra". A trial status "Trial • 14 days left" is also shown. The main content area displays a "Research report" for "Recent Advances in Hybrid Organic-Metallic Fluorescent Pro...". The report summary asks: "What are the recent protocols for the synthesis of hybrid organic–metallic fluorescent probes and what are their applications?". It states that Elicit is building understanding of the research and will email the user when the report is ready. Below this, a "Screen sources" section shows progress: "24% · 1:19 elapsed (3 minutes estimated)". A table shows experimental data: "Does the study include experimental synthesis or ...". The table has columns "Experimental Data", "Definition", and "Criteria matches (yes/maybe/no)". The data shows 27 yes, 83 maybe, and 10 no. To the right, a "Report" sidebar lists steps: "Gather sources" (499 sources found), "Screen sources" (Filtering studies based on inclusion criteria), "Extract data" (Capturing key metrics and findings from every paper), and "Generate report" (Summarizing findings). A "Chat" section is also present.

Recent Advances in Hybrid Organic-Metallic Fluorescent Pro... Research report

DECEMBER 22, 2025

What are the recent protocols for the synthesis of hybrid organic–metallic fluorescent probes and what are their applications?

Recent protocols for hybrid organic–metallic fluorescent probe synthesis primarily involve multi-step ligand-exchange functionalization of gold and silver nanoparticles or DNA-templated assembly methods that enable precise control of fluorophore–metal spacing, with these probes being applied to metal ion sensing, biomedical imaging, chemical detection, and security systems, though detailed reproducible protocols remain limited in the published literature.

ABSTRACT

This systematic review examined ten sources addressing synthesis protocols and applications of hybrid organic–metallic fluorescent probes. Two primary synthesis approaches were identified with detailed

Report

Status

- Gather sources 50 sources found
- Screen sources 10 sources included
- Extract data 60 data points extracted
- Generate report

Save PDF

Chat

Recent Advances in Hybrid Organic-Metallic Fluorescent Pro... Research report

fluorescence self-quenching at high surface coverages *. The evidence supports that hybrid probe design is modular and adaptable to specific applications, though detailed, reproducible protocols remain limited in the accessible literature.

METHODS

Papers identified with Elicit search n = 50

Papers uploaded manually n = 0

Papers screened using: Hybrid Organic-Metallic Components, Synthesis Protocols or Applications, Fluorescent Properties Confirmation, Publication Type, Hybrid System Focus, Experimental Data n = 50

Paper search

We performed a semantic search using the query "What are the recent protocols for the synthesis of hybrid organic–metallic fluorescent probes and what are their applications?" across over 138 million academic papers from the Elicit search engine, which includes all of Semantic Scholar and OpenAlex.

We retrieved the 50 papers most relevant to the query.

Report

Status

- Gather sources 50 sources found
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- Generate report

Save PDF

Chat

Synthesis Protocols

Detailed synthesis protocols were available primarily from the two experimental studies with full-text access. The synthesis approaches can be categorized into multi-step ligand-exchange procedures and template-based assembly methods.

Study	Synthetic Approach	Key Steps
M. Alloisio et al., 2016	Multi-step ligand exchange and functionalization *	1) Reduction of metal salts to form Au/Ag NPs Passivation with spacers (SAPA, 8 3) Functionalization with fluorescent dyes *
Mickaël P. Busson et al., 2012	DNA-templated assembly *	1) Coat 40 nm AuNPs with phospholigand 2) Lengthen strands by thermal annealing 3) Modify DNA with

Report

Status

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Save PDF

Chat

The screenshot shows a Microsoft Edge browser window with the following details:

- Title Bar:** Elicit - Recent Advances in Hybrid Organic-Metallic Fluor... (partially visible)
- Search Bar:** A search bar at the top right contains the query "Recent Advances in Hybrid Organic-Metallic Fluorescent Probes".
- Search Results:** The main content area displays a search result from Semantic Scholar. It includes:
 - Abstract:** A brief summary of the research.
 - Text:** The full text of the academic paper.
 - Image:** A thumbnail image of the document page.
 - Page Number:** The number "1" indicating the current page of the document.
- Left Sidebar:** A sidebar on the left side of the main content area.
- Right Sidebar:** A sidebar on the right side of the main content area.
- Bottom Navigation:** A navigation bar at the bottom of the page.

3/ Verification with Semantic Scholar :

The screenshot shows a search result for 'Recent Advances in Hybrid Organic-Metallic Fluorescent Pro...' on the Elicit platform. The top navigation bar includes 'Elicit', 'Recents', 'Library', 'Alerts', 'Trial • 14 days left', 'Help', and a user profile for 'RIHEL Fatma Zohra'. Below the search bar, the title 'Recent Advances in Hybrid Organic-Metallic Fluorescent Pro...' is displayed with a 'Research report' button. The main content area lists several references:

- Rui Gao, Mohamad S. Kodaimati, Dongpeng Yan (2021). *Recent advances in persistent luminescence based on molecular hybrid materials*. Chemical Society Reviews
- Sameera Sh. Mohammed Ameen, K. Omer (2024). *Recent Advances of Bimetallic-Metal Organic Frameworks: Preparation, Properties, and Fluorescence-Based Biochemical Sensing Applications*. ACS Applied Materials and Interfaces
- Mickael P. Busson, B. Rolly, B. Stout, N. Bonod, J. Wenger, and 1 more (2012). *Photonic engineering of hybrid metal-organic chromophores*. Angewandte Chemie
- Priyam Singh, Santosh Kachhap, Prabhakar Singh, S.K. Singh (2022). *Lanthanide-based hybrid nanostructures: Classification, synthesis, optical properties, and multifunctional applications*. Coordination chemistry reviews
- Sobhan Chatterjee, Hardip Singh Gorhi, I. Raval, S. Chatterjee, A. R. Patial (2019). *An Anthracene Excimer Fluorescence Probe on Mesoporous Silica for Dual Functions of Detection and Adsorption of Mercury (II) and Copper (II) with Biological In Vivo Applications*. Small
- M. Alloisio, Melania Rusu, S. Ottонello, M. Ottонelli, S. Thea, and 1 more (2016). *Synthesis of Fluorescent Core-Shell Metal Nanohybrids: A Versatile Approach*. Materials

At the bottom, there are download buttons for 'Download BIB', 'Download RIS', and 'Download TXT'. To the right, a sidebar titled 'Citation details' shows the first reference and a 'Back' button. Below the sidebar, the text 'Photonic engineering of hybrid metal-organic chromophores.' is displayed. Navigation buttons for '1 of 11', 'Previous', and 'Next' are also present.

**SEMANTIC SCHOLAR** Priyam Singh, Santosh Kachhap, Prabhakar Singh, S.K. Singh (2022). Lanthanide-based hybrid nanostructur... Search Q Sign In Create Free Account

4/ Critical evaluation with Scite :

The screenshot shows the Scite AI application interface. At the top, there is a navigation bar with links for "scite_ Assistant Search Pricing More" and buttons for "Log In" and "Sign Up". Below the navigation bar, a sidebar on the left titled "Your sessions" displays a message: "You need a premium account to save Chat Sessions. Please log in or upgrade." with a blue "Upgrade" button. The main content area contains a search bar with the placeholder "Ask me another question" and a blue "Ask" button. A message box states: "Custom Assistant Settings are being used for this session." Below this, a card shows a citation: "Mickaël P. B (2012). Photonic engineering of hybrid metal-organic" followed by an error message: "There was an error: An unknown error occurred (status code: 400) when generating a response. Please try again, or contact customersupport@researchsolutions.com with details if it persists." A blue "Start free trial" button is visible at the bottom right of the main content area.

5/ Gestion des références avec Zotero

J'ai utilisé Zotero pour importer les articles,

The screenshot shows the Zotero library interface. The top menu includes "Fichier", "Édition", "Affichage", "Outils", and "Aide". The main window displays a list of imported articles under the folder "10.1038_nmeth817-citation". The left sidebar shows the library structure with sections like "Ma bibliothèque" (containing "10.1038_nmeth817...", "Mes publications", "Doublons", "Non classés", and "Corbeille"), "Bibliothèques de groupe" (containing "GP-OP doctorat" with "S0039791124000...", "Doublons", "Non classés", and "Corbeille"), and "Nouveau dossier". The right pane lists the articles with their titles and creators:

Titre	Créateur
Synthèse régiosélective par voie organométallique de pyridines, 4-picolines et 3,5-luti...	Al-Arnaout et al.
Synthèse régiosélective par voie organométallique de nouveaux aryl-1 triazolyl-2 étha...	Chollet et al.
Synthèse d'un ligand cyclopentadienyle pentaalkyle optiquement actif applications en ...	Dormond et al.
Synthesis, crystal structure and spectral characteristics of highly fluorescent chalcone-...	Ghouili et al.
[1,3,5]-Triazine: A Versatile Heterocycle in Current Applications of Organic Chemistry	Giacomelli et al.
Introduction to Fluorescence	Lakowicz
Chimie organométallique	Levisalles et al.
Fluorescence microscopy	Lichtman et Conc...
Catalysis by molecular iodine: A rapid synthesis of 1,8-dioxo-octahydroxanthenes and ...	Mulakayala et al.
Synthesis and Transformations of Nitrones for Organic Synthesis	Murahashi et Ima...
La fluorescence de résonance : Etude par la méthode de l'atome habillé	Reynaud
A Review on Schiff Base Fluorescent Chemosensors for Cell Imaging Applications	Udhayakumari et...
Iron(III)/Copper(II)-Cocatalyzed Cycloaddition/[3,3]-Rearrangement/N–O Bond Cleava...	Zou et al.

J'ai créé sous-dossiers dans "RIHELI.FZ"

The screenshot shows a digital library interface with a sidebar and a main search results area.

Left Sidebar:

- Ma bibliothèque
 - 10.1038_nmeth817...
 - Mes publications
 - Doublons
 - Non classés
 - Corbeille
- Bibliothèques de groupe
 - GP-OP doctorat
 - RIHELI.FZ
 - Doublons
 - Non classés
 - Corbeille
- Nouveaux membres

Right Area:

Search bar: RIHELI.FZ

Filter buttons: Titre, Créditeur, Champs & Marqueurs

Table of search results:

Synthesis, crystal structure and spectral characteristics of highly fluorescent chalcone-...	Ghouili et al.
[1,3,5]-Triazine: A Versatile Heterocycle in Current Applications of Organic Chemistry	Giacomelli et al.
Chimie organometallique	Levisalles et al.
Catalysis by molecular iodine: A rapid synthesis of 1,8-dioxo-octahydroxanthenes and ...	Mulakayala et al.
Asymmetric Diels-Alder reaction of chalcone and isoprene mediated by titanium-base...	Thy et al.