



CAS STNext[®] COFFEE LECTURE 

**Exploring the Materials Cluster on
CAS STNext[®]**

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 **FIZ Karlsruhe**
Leibniz Institute for Information Infrastructure

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CAS STNext's Materials Cluster

Multiple sources for polymers, ceramics, alloys and others

=> `index materials`

```
INDEX '1MOBILITY, 2MOBILITY, APOLLIT, CAPLUS, CBNB, CEABA, CIN, COMPENDEX,  
IFIAL, INSPEC, PIRA, PQSCITECH, RAPRA, RDISCLOSURE, REAXYSFILEBI,  
SCISEARCH, TEMA, USPATFULL, USPATOLD, USPAT2, WSCA'
```

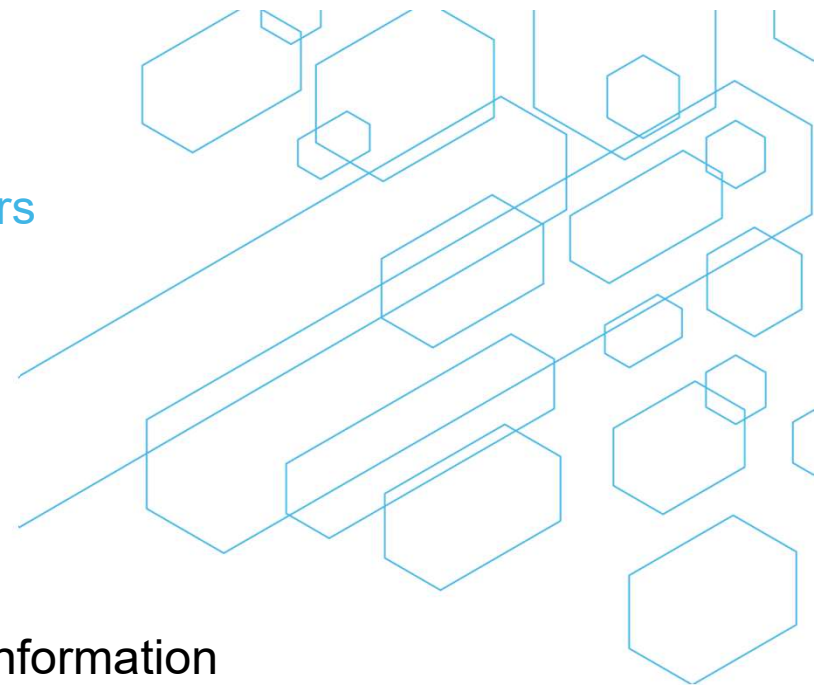
21 FILES IN THE FILE LIST IN STNINDEX

CBNB, CIN, RAPRA and TEMA covering also business information

1/2MOBILITY cover automotive industry materials

Compendex, Inspec, PQSciTech and SciSearch are larger files

CAS files having strongest compound identification options



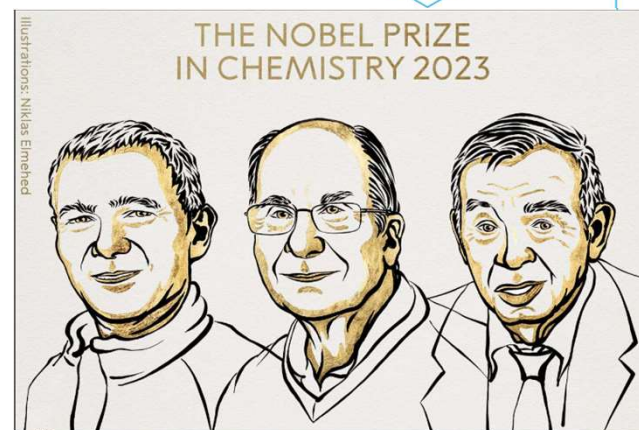
Focus on quantum dots

Moving away from Cd-based materials

Quantum dots are inorganic materials in nanoscale form that have light emitting properties dependent on their size

Quantum dots find applications in television, LED lamps, but also in a variety of analytical techniques

Aleksey Yekimov, Louis Brus and Moungi Bawendi shared the Nobel Prize 2023 for their contributions to this field of research



Index command for broad orientation

Which databases have significant results on my initial query

=> s quantum dot

62	FILE 1MOBILITY
31	FILE APOLLIT
172292	FILE CAPLUS
352	FILE CBNB
4244	FILE CEABA
54	FILE CIN
96940	FILE COMPENDEX
22452	FILE IFIALL
86660	FILE INSPEC
237	FILE PIRA
33464	FILE PQSCITECH
3629	FILE RAPRA
7	FILE RDISCLOSURE
91893	FILE REAXYSFILEBI
142724	FILE SCISEARCH
18826	FILE TEMA
78385	FILE USPATFULL
42068	FILE USPAT2
137	FILE WSCA

=> d rank

F1	172292	CAPLUS
F2	142724	SCISEARCH
F3	96940	COMPENDEX
F4	91893	REAXYSFILEBI
F5	86660	INSPEC
F6	78385	USPATFULL
F7	42068	USPAT2
F8	33464	PQSCITECH
F9	22452	IFIALL
F10	18826	TEMA
F11	4244	CEABA
F12	3629	RAPRA
F13	352	CBNB
F14	237	PIRA
F15	137	WSCA
F16	62	1MOBILITY
F17	54	CIN
F18	31	APOLLIT
F19	7	RDISCLOSURE

19 FILES HAVE ONE OR MORE ANSWERS, 21 FILES SEARCHED IN STNINDEX

Searching quantum dot by composition

Zinc oxides with 2 additional metals

```
FILE 'REGISTRY' ENTERED
L2      22927 S ZN/ELS AND O/ELS AND 4/ELC.SUB
L3      13105 S L2 NOT (C OR S OR N OR P OR SE OR X)/ELS
```

```
FILE 'CAPLUS' ENTERED
L4      265 S L3 AND QUANTUM DOT
L5      206 S L3/TEM AND QUANTUM DOT
```

=> ana hit rn

```
L6      ANALYZE L5 1- RN HIT :      67 TERMS
```

=> d 15

```
L6      ANALYZE L5 1- RN HIT :      67 TERMS
```

TERM #	# OCC	# DOC	% DOC	RN
1	100	100	48.54	151248-91-8 (Ga.In.O.Zn)
2	23	23	11.17	150477-54-6 (In.O.Sn.Zn)
3	14	14	6.80	440368-68-3 (Li.Mg.O.Zn)
4	11	11	5.34	13597-65-4 (H2SiO4.Zn)
5	11	11	5.34	244049-39-6 (In.O.Si.Zn)

Sample record

AN 2023:1055864 CAPLUS Full-text
DN 183:71591
TI An investigation on the cyclic temperature-dependent performance behaviors of ultrabright air-stable QLEDs
AU Zanjani, Saeedeh Mokarian; Sadeghi, Sadra; Shahalizad, Afshin; Pahlevani, Majid
CS Department of Electrical and Computer Engineering, Queen's University, Kingston, ON, K7L 3N6, Can.
SO arXiv.org, e-Print Archive, Physics (2023) 1-21, 2023
URL: <http://arxiv.org/archive/physics>
DT Preprint
IT Optoelectronics
Quantum dots
Quenching (cooling)
IT **440368-68-3P**, Lithium magnesium zinc oxide
RL: NANO (Nanomaterial); PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(investigation on cyclic temp.-dependent performance behaviors of ultrabright air-stable quantum-dot light-emitting diodes)

Search in Reaxysfilesub and Reaxysfilebib

```
FILE 'REAXYSFILESU' ENTERED
L10      158129 S ZN/ELS
L11      10435 S ZN/ELS AND O/ELS AND 4/ELC.SUB
L12      5523 S L11 NOT (C OR S OR N OR P OR SE OR X)/ELS
```

```
FILE 'REAXYSFILEBI' ENTERED
L13      5259 S L12
L14      16 S L13 AND QUANTUM DOT
```

Sample record

AN 124218051 REAXYSFILEBI Full-text
TI Graphene **quantum dots** (GQDs) decorated Co-Zn ferrite: Structural, morphological, dielectric, and magnetic properties
AU Rashid, Sania;Perveen, Saima;Hafeez, Saiqa;uddin Asad, Samsaam;Khan, Muhammad Zarrar;Azad, Fahad
SO Journal of Magnetism and Magnetic Materials (2023), Volume 570, 170548
DOI: <https://doi.org/10.1016/j.jmmm.2023.170548>
DT Journal
LA English
ED Entered STN: 28 Mar 2023
Last updated on STN: 16 Jun 2023
AB GQDs/Co_{0.5}Zn_{0.5}Fe₂O₄ nanocomposite was synthesized using a facile sonication-assisted approach. X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FTIR), scanning electron microscopy (SEM), elemental dispersive X-ray spectroscopy (EDX), impedance analyzer and vibrating sample magnetometer (VSM) were employed to characterize the synthesized samples. The XRD data confirmed the formation of GQDs, Co-Zn ferrite and GQDs/Co-Zn ferrite nanocomposite with no detectable impurity peaks. FTIR results identified the presence of GQDs in GQDs/Co-Zn ferrite nanocomposite. The morphological study revealed the decoration ...

Inspec has an option to search composition

Chemical Indexing for inorganic formulas

ST adsorption; band-edge emission; C:N-ZnO/ss; chemical interaction; chemisorption; hexagonal wurtzite structure; hydrothermally synthesized N-CQD; narrow size distribution; nitrogen-doped CQDs; nonradiative UV energy transfer; photoluminescence emission; Raman spectra; SEM images; sol-gel spin-coating process; solution processed highly transparent nitrogen-doped carbon quantum dot-ZnO hybrid thin films; spin-coated ZnO thin film; TEM; UV emission; UV excitation; visible region; wavelength 325.0 nm; wavelength 383.0 nm; XPS; ZnO crystallites; ZnO nanoparticles

CHI C:NZnO ss, NZnO ss, Zn ss, C ss, N ss, O ss, C el, NZnO dop, Zn dop, N dop, O dop

FILE 'INSPEC' ENTERED AT 11:40:26 ON 11 DEC 2023
L15 76180 S ZN SS/CHI AND O SS/CHI
L16 738 S L15 AND QUANTUM DOT

There is less control over the other 2 elements being present

General approach for other materials files

SciSearch, Compendex and PQSciTech offer general keyword searches

```
FILE 'SCISEARCH, COMPENDEX, PQSCITECH' ENTERED
L25      16878 SEA FILE=SCISEARCH QUANTUM DOT AND (ZINC? OR ZNO? OR ZN)
L26      11791 SEA FILE=COMPENDEX QUANTUM DOT AND (ZINC? OR ZNO? OR ZN)
L27      4012 SEA FILE=PQSCITECH QUANTUM DOT AND (ZINC? OR ZNO? OR ZN)
TOTAL FOR ALL FILES
L28      32681 SEA FILE=MFE QUANTUM DOT AND (ZINC? OR ZNO? OR ZN)
```

Sample record for each

SciSearch has most extensive citation and grant information

AN 2023:734999 SCISEARCH Full-text
TI Heteroepitaxial chemistry of zinc chalcogenides on InP nanocrystals for defect-free interfaces with atomic uniformity
AU Choi, Yeongho (Reprint)
CS Sungkyunkwan Univ, SKKU Inst Energy Sci & Technol SIEST, Suwon 16419, South Korea (Reprint)
AU Hahm, Donghyo
CS Los Alamos Natl Lab, Chem Div, Los Alamos, NM 87545 USA
CYA South Korea; USA
SO NATURE COMMUNICATIONS, (3 2023 JAN 2023) Vol. 14, No. 1.
DOI 10.1038/s41467-022-35731-2
REC Reference Count: 68
GF The authors gratefully acknowledge the support from the National Research Foundation of Korea (NRF) grants funded by the Korean government (NRF-2021M3H4A3A01062964).
GO National Research Foundation of Korea (NRF) - Korean government
GN NRF-2021M3H4A3A01062964
GN NRF-2022R1A2C2011496; NRF-2022R1A4A3018802; NRF-2019M3D1A1078299
GO Samsung Display Co., Ltd.
CC Multidisciplinary Sciences
STP KeyWords Plus (R): MITSUNOBU ESTERIFICATION REACTION; CDSE/CDS CORE/SHELL NANOCRYSTALS; COLLOIDAL QUANTUM DOTS; HIGHLY EFFICIENT; OPTICAL GAIN; LIGHT; SIZE; MECHANISM; INVOLVEMENT; SUPPRESSION

Sample record from each

Compendex has good keyword and classification indexing

AN 2023-4815113269 COMPENDEX Full-text
TI Developing a Se Quantum Dots@ CoFeOx Composite Nanomaterial as a Highly Active and Stable Cathode Material for Rechargeable Zinc-Air Batteries
AU Zhang Donghao (1); Wang Yang (1,2); Han Xiaopeng (1); Hu Wenbin (1,3)
CS (3)Joint School of National University of Singapore and Tianjin University, International Campus of Tianjin University, Binhai New City, Fuzhou, China
EMAIL: xphan@tju.edu.cn; wbhu@tju.edu.cn
SO Batteries (1 Nov 2023), Volume 9, Number 11, arn: 561, 72 refs. E-ISSN: 2313-0105
DOI: <https://doi.org/10.3390/batteries9110561>
DT Journal; Article

CC 533.1 Ore Treatment; 546.3 Zinc and Alloys; 547.1 Precious Metals; 702.1.2 Secondary Batteries; 714.2 Semiconductor Devices and Integrated Circuits; 761 Nanotechnology; 802.2 Chemical Reactions; 803 Chemical Agents and Basic Industrial Chemicals; 804 Chemical Products Generally; 804.2 Inorganic Compounds; 933.1 Crystalline Solids and Crystallography
CT *Semiconductor quantum dots; Cathodes; Electrocatalysts; Electrolytic reduction; Iridium compounds; Iron oxides; Nanocrystals; Open circuit voltage; Oxygen; Platinum compounds; Precious metals; Zinc; Zinc air batteries
ST Bi-functional; Catalytic-kinetic; Cathodes material; Clean energy; Composite nanomaterial; Oxygen reduction reaction; Rechargeable zinc-air batteries; Reduction oxygen; Zinc-air battery;]+ catalyst

Sample records for each

PQSciTech from Proquest with Solid State and Superconductivity Abstracts

AN 2023:441534 PQSCITECH Full-text
DN 2891753861
TI Novel 2D photocatalyst of copper-doped carbon quantum dot CD(Cu) loaded with ultrathin Ni-MOL for degradation of tetracycline
AU Li, Zuyu ; Li, Da ; Yu, Fei ; Dong, Liming ; Zang, Lihua ; Zhang, Junjie ; Shi, Linglong ; Ge, Xiuli ; Guo, Shuangzhen ; Zheng, Yixuan
SO Water Science and Technology, Vol. 86, No. 7, pp. 1835-1847, 20221001
DOI: <https://doi.org/10.2166/wst.2022.306>
DT Journal; Article
LA English
ED Entered STN: 29 Nov 2023
Last updated on STN: 29 Nov 2023
CT Degradation; Nitrates; Zinc; Photocatalysts; Iron; Semiconductors; Degradation; Water pollution; Nickel; Carbon dots; Cobalt; Copper; Copper; Energy; Iron; Potassium; Light absorption; Degradation; Photocatalysis; Efficiency; Crystal structure; Catalytic activity; Zinc; Electromagnetic absorption; Pollutant removal; Antibiotics; Carbon; Zinc; Damping; Carbon; Quantum dots; Photocatalysis; Copper; Quantum dots; Light; Potash; Morphology
UT carbon dots

Numeric Property Search

Searching for peak wavelength around 465 nm

=> s quantum dot and peak(5a)465+-5 nm/len(nota)(450 nm or 480nm)/len

L47 50 FILE INSPEC
L48 50 FILE COMPENDEX
L49 12 FILE PQSCITECH

TOTAL FOR ALL FILES

L50 112 QUANTUM DOT AND PEAK(5A) 465+-5 NM/LEN(NOTA)(450 NM OR 480NM)/LEN

L50 ANSWER 4 OF 112 INSPEC COPYRIGHT 2023 IET on STN.
TI Multiple Cations Enhanced Defect Passivation of Blue Perovskite Quantum Dots Enabling Efficient Light-Emitting Diodes
SO Advanced Optical Materials (2020), Volume 8, Number 24, 2001494 (9 pp.) p., 58 refs.
AB All inorganic perovskite quantum dots (ABX₃, A = Cs, B = Pb, X = Cl, Br, or I) are potential candidates for wide-color-gamut display applications. High-efficiency green and red perovskite quantum dot (PeQD) light-emitting diodes (LEDs) have been achieved, however, development of blue-emitting devices, especially those with the relatively short wavelengths (< . . . structure to facilitate the hole transport, PeQDLEDs based on multiple-cation PeQDs show the maximum EQE of 2.14% and the emission **peak** at **467 nm** with a full width at half maximum of 16 nm. This work would open up a new avenue to. . .

Business information in CBNB and CIN

Market research on medical applications for quantum dots

AN 3944045901 CBNB Full-text

TI Medical imaging reagents global market research report 2023: nanoparticles, fluorescent dyes, probes, fluorescent proteins, quantum dots markets, competition and forecasts, 2017-2022, 2022-2027, 2032F. [1 table, 1 figure in original article]

SO globenewswire (25 Oct 2023), (900 plus words)

AB The "Medical Imaging Reagents Global Market Report 2023" report has been added to ResearchAndMarkets.com's offering. The global medical imaging reagents market is expected to grow from \$13.04 bn in 2022 to \$14.06 bn in 2023 at a compound annual growth rate (CAGR) of 7.8%. The medical imaging reagents market is expected to reach \$18.24 bn in 2027 at a CAGR of 6.7%. The increase in the prevalence of chronic diseases is expected to propel the growth of the medical imaging reagents market going forward. Product innovations are a key trend gaining popularity in the medical imaging reagents market. Major companies operating in the medical imaging reagents market are focused on developing new solutions to sustain their position in the market. North America was the largest region in the medical imaging reagents market in 2022. Major players in the medical imaging reagents market are General Electric Company (GE Healthcare), Lantheus Holdings Inc, Thermo Fisher Scientific Inc, Bayer AG, Bracco SpA, Siemens AG, PerkinElmer Inc, Cardinal Health Inc, Shimadzu Corporation, Philips Healthcare, SA Laboratoires Andre Guerbet, Li-cor Biosciences Inc, Canon Medical Systems Corporation, Fujifilm Healthcare, and Aidoc Medical. A table shows the report attribute.

Summary

Materials cluster on CAS STNext for ZnO-based Quantum Dots

Registry – CAplus search specific compositions for Zn-M-M-O

ReaxysfileSub/Bib search compositions, same strategy

Inspec – Inorganic formula searching

Compendex-Scisearch-PQSciTech general keywords and Numeric properties search

CBNB-CIN for business information

Between problems
and progress
are connections
that matter



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