



CAS STNEXT® COFFEE LECTURE

MEET THE DATABASE: PQSCITECH

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CAS 
A division of the
American Chemical Society

Today, we will...

- Explore the content of the PQSCITECH database, a large collection of bibliographic records covering all areas of science and technology
- Show how database features, including Numeric Property Searching (NPS), increase both precision and recall when searching for scientific literature
- Show options for retrieving original full-text documents from search results
- Show how PQSCITECH works alongside other CAS STNext databases to provide comprehensive search results

Agenda

- Content and Coverage
- Database features
- Search Tips/Use cases

Once upon a time...

SOLIDSTATE

COMPUAB

MECHENG

ANTE

POLLUAB

ELCOM

AQUALINE

AEROSPACE

ALUMINUM

CORROSION

LISA

CERAB

LIFESCI

CIVILENG

BIOENG

AQUASCI

OCEAN

ENVIROENG

METADEX

EMA

CONFSCI

COPPERLIT

MATBUS

WATER

HEALSAFE

PQSCITECH

PQSCITECH (ProQuest Science & Technology)

PRODUCER ProQuest LLC

CONTENT All areas of science and technology.
Bibliographic information, indexing, and abstracts.

TIME COVERAGE 1962-present

UPDATE FREQUENCY Monthly (~40k records per month)

FILE SIZE >34.3 million records

CHARACTERISTICS PQSCITECH is a merge of the former CSA file (AEROSPACE, ALUMINIUM, ANTE, AQUALINE, AQUASCI, BIOENG, CERAB, CIVILENG, COMPUAB, CONFSCI, COPPERLIT, CORROSION, ELCOM, EMA, ENVIROENG, HEALSAFE, LIFESCI, LISA, MATBUS, MECHENG, METADEX, OCEAN, POLLUAB, SOLIDSTATE, and WATER.)

Uncontrolled terms (UT) are searched with CT and BI

STN numeric property search

Database Summary Sheet

Definitive source for information about fields and formats

3
PQSCITECH

6
PQSCITECH

DISPLAY and PRINT Formats

Any combination of formats may be used to display or print answers. Multiple codes must be separated by spaces or commas, e.g., D L1 1-5 TI AU. The fields are displayed or printed in the order requested.

Hit-term highlighting is available for all fields. Highlighting must be ON during SEARCH to use the HIT, KWIC, and OCC formats.

Format	Content	Examples	
AB	Abstract	D TI AB	INDUSTRIAL MEASUREMENT MANAGEMENT(L)TEAM SPECTRA?
ALI (5)	Alloy Indexing Term	D ALI	
AN	Accession Number	D 1-5 AN	LTISENSOR/AB 04000021/AN JSTAR/ALI
AU	Author	D AU TI	
AV (1,6)	Availability	D AV	N, ?/AU
CC (5)	Classification Code	D CC	N C S/AU
CCA (5)	Classification Code Alloy	D CCA	ITISH LIBRARY
CS (5)	Corporate Source	D CS	AIRCRAFT COMMUNICATIONS/CC
CT	Controlled Term	D CT	INGANESE STEELS/CCA
DN	Document Number	D DN	NCHESTER AIRPORT/CS
DT (TC)	Document Type	D DT	AEROBIC DIGESTION/CT INGANESE/CW
ED	Entry Date	D ED	
EML (2,5)	E-mail Address	D EML	2514/1.46731/FTDOI
FA	Field Availability	D FA	0014/DN
FTDOI (2)	Digital Object Identifier	D FTDOI	REFERENCE ARTICLE/DT
IN (5)	Inventor	D IN	
ISN (2)	International Standard (Document) Number	D ISN	
JT (2)	Journal Title	D JT	
LA	Language	D LA TI	
MD (2,3,5)	Meeting Date	D MD	
ML (2,3,5)	Meeting Location Title	D ML	

Search Examples	Display Codes
INDUSTRIAL MEASUREMENT MANAGEMENT(L)TEAM SPECTRA?	AB, CT, TI, UT
LTISENSOR/AB 04000021/AN JSTAR/ALI	AB AN ALI AU
N, ?/AU N C S/AU ITISH LIBRARY AIRCRAFT COMMUNICATIONS/CC INGANESE STEELS/CCA NCHESTER AIRPORT/CS	AV CC CCA CS
AEROBIC DIGESTION/CT INGANESE/CW 2514/1.46731/FTDOI 0014/DN REFERENCE ARTICLE/DT	CT CT FTDOI, SO DN DT

Multiple types of source documents for broad coverage

L2	ANS	L4	ANSWER 2 OF 39 PQSCITECH COPYRIGHT 2024 ProQuest LCC on STN.
AN	201	AN	2023:4848
DN	205	DN	289317458
TI	Be	TI	Limit Eff
IN	Spe	AU	Evstignee
PA	Wid	SOKOLOVSK	Sokolovsk
PI	us	SO	Micromach
SO	App	DOI:	http
DT	Pat	Published	Published
FS	Med	DT	Journal ;
	ANT	LA	English
	Hig	ED	Entered S
LA	Eng		Last upda
ED	Ent		Last updated on STN: 1
		L6	ANSWER 1 OF 11 PQSCITECH COPYRIGHT 2024 ProQuest LCC on STN.
		AN	2016:1001664 PQSCITECH Full-text
		DN	PQ0003084172
		TI	A betavoltaic microbattery using zinc oxide nanowires under build in potential difference
		AU	Zhang, Qiang; Wang, Na; Zhou, Peng; Chen, Changsong; San, Haisheng; Wang, Kaiying; Chen, Xuyuan
		CS	Pen-Tung Sah Institute of Micro-Nano Science and Technology, Xiamen University, Xiamen, Fujian, China
		SO	The Institute of Electrical and Electronics Engineers, Inc. (IEEE) Conference Proceedings. pp. 1177-1180. Jan 2016. DOI: 10.1109/MEMSYS.2016.7421846
			Published by: Institute of Electrical and Electronics Engineers, Inc. Conference: 2016 IEEE 29th International Conference on Micro Electro Mechanical Systems (MEMS), Shanghai, China (China), 20160124/20160128
		PUI	0b00006484fbb6fa
		DT	Journal; Article; Conference
		FS	Mechanical & Transportation Engineering Abstracts (MT); Electronics and Communications Abstracts (EA)

Agenda

- Content and Coverage
- Database features
- Search Tips/Use cases

Numeric Property Search Feature

- Numeric search terms can be combined with text-based search terms of interest
 - Using standard text-based proximity operators
 - Specifying text search fields of interest
- Flexible data input options are available
 - Ranges, exact values and tolerances
 - A wide variety of search units

Property Field Info in the Database Summary Sheet

Property Fields¹⁾

In PQSCITECH a numeric search for a specific set of physical properties (/PHP) is available within the title and abstract fields. The numeric values are not displayed as single fields, but highlighted within the hit displays.

Use EXPAND/PHP to search for all available physical properties. A search with the respective field codes will be carried out in the abstract and title fields. The /PHP index contains a complete list of codes and related text for all physical properties available for numeric search.

Field Code	Property	Unit	Symbol	Search Examples
/AOS	Amount of substance	Mol	mol	S 10 /AOS
/BIR	Bit Rate	Bit/Second	bit/s	S 330/BIR
/BIT	Stored Information	Bit	Bit	S BIT > 3 MEGABIT
/CAP	Capacitance	Farad	F	S 1-10 MF/CAP
/CDN	Current Density	Ampere/Square Meter	A/m ²	S CDN>10 A/M**2
/CMOL	Molarity, Molar Concentration	Mol/Liter	mol/L	S UREA/BI (S) 2/CMOL
/CON	Conductance	Siemens	S	S 1S-3/CON
/DB	Decibel	Decibel	dB	S DB>50
/DEG	Degree	Degree	°	S CYLINDER/BI (S) 45/DEG
/DEN	Density (Mass Concentration)	Kilogram/Cubic Meter	kg/m ³	S 5E-3-10E-3/DEN
/DEQ	Dose Equivalent	Sievert	Sv	S 2/DEQ
/DOS	Dosage	Milligram/Kilogram	mg/kg	S DOS>0.8
/DV	Viscosity, dynamic	Pascal * Second	Pa * s	S DV>5000
/ECD	Electric Charge Density	Coulomb/Square Meter	C/m ²	S 10E-6 – 10E-5 C/M**2 /ECD
/ECH	Electric Charge	Coulomb	C	S 2-3/ECH
/ECO	Electrical Conductivity	Siemens/Meter	S/m	S ECO>800 S/M

Extracting, normalizing and indexing numeric data

- Numeric property data is captured from all English-language text fields, then made accessible for searching
- Numbers and their units within the English-language text are identified
 - About 1,800 property unit variants are identified
 - Numbers are considered from exact values, in closed ranges and open ranges
 - Numerals are detected as well in most databases
- Identified original data are normalized to base units and indexed for searching

Numeric search options

=> **S 50/VOL**

L1 11048 50 M**3 /VOL

Search with **default units**.

=> **S 50-60/VOL**

L2 11338 50 M**3 - 60 M**3 /VOL

Search with **closed ranges**.

=> **S 10-30 ML/VOL**

L3 200076 10-30 ML/VOL

Search with **other units**.

=> **S SIZ < 5 MM**

L4 2200679 SIZ < 5 MM

Search with **open ranges**.

=> **S 5 MM +-1/SIZ**

L5 7603645 MM +-1/SIZ

Search with **tolerances**.

=> **S 5 MM +-5%/SIZ**

L6 666228 5 MM +- 5%/SIZ

Search with **tolerances in %**

Additional Database Features

- Digital Object Identifiers (/FTDOI), where available, to point to original documentation and options for obtaining primary source materials
- Reference Counts (/REC or /RE.CNT) provide information about citation data in records and can be used to search or refine results
- Controlled Terminology (/CT) in many records increases precision and recall

Agenda

- Content and Coverage
- Database features
- Search Tips/Use cases

Basic Keyword Search in PQSCITECH

Proximity, truncation, and all basic commands

```
=> S (?BETA? (T) ?VOLTAIC?) (5A) ?BATTER?
```

```
666666 ?BETA?
```

```
92246 ?VOLTAIC?
```

```
195110 ?BATTER?
```

```
L4          52 (?BETA? (T) ?VOLTAIC?) (5A) ?BATTER?
```

```
=> D SCAN
```

```
L4          52 ANSWERS PQSCITECH COPYRIGHT 2024 ProQuest LCC on STN.
```

```
TI          Silicon Betavoltaic Batteries Structures
```

```
UT          Betavoltaic battery; Isotope; Multi-junction solar cell; Silicon;  
Battery; Microelectromechanical systems; Radioisotope
```

Did you know?

The (T) proximity operator links search terms between or within larger terms – great for searching with compound words

Controlled Terminology provides insights

L2 121 ANSWERS PQSCITECH COPYRIGHT 2024 ProQuest LCC on STN.
TI Efficiency advance makes **betavoltaics** a reality
CC 71 General and Nonclassified (MD); G1 General and Nonclassified (EC); G1
General and Nonclassified (ED); G1 General and Nonclassified (EP); B9
World Industry News, Company Information, General Issues (MB)
CT Semiconductors; Energy (nuclear); Decay; Silicon; Battery; Beta
particles; Diodes; Electric current; Sun; Standards; Direct power
generation; Energy use; Turning; Construction standards; Capture
(nuclear); Tritium; Electric batteries; Construction industry

Did you know?

Scanning initial keyword results shows options for adding controlled terminology to refine the search strategy

EXPAND in /CT to find terminology to increase precision

=> E BETA PARTICLES/CT

E1

E2

E3

E4

E5

=> E BATTERIES/CT

E1

E2

E3

E4

E5

=> E ELECTRIC BATTERIES/CT

E1 1 ELECTRIC AUXILIARY HEATER/CT

E2 1 ELECTRIC BASEMENT/CT

E3 64812 --> ELECTRIC BATTERIES/CT

E4 1 ELECTRIC BATTERIES HERMETIC SEALS NICKEL CADMIUM BATTERIES O
AO SPACECRAFT POWER SUPPLIES STORAGE BATTERIES/CT

E5 7 ELECTRIC BATTERIES SUBSTITUTION/CT

E6 3 ELECTRIC BATTERIES, PRIMARY/CT

E7 11 ELECTRIC BATTERIES, SECONDARY/CT

Did you know?

Controlled terms can be added to an existing search strategy to refine, or you can start a search by EXPANDING in /CT to discover relevant terminology.

Hit term highlighting provides context

L7 ANSWER 3 OF 52 PQSCITECH COPYRIGHT 2024 ProQuest LCC on STN.

AB For low-power miniature energy creation sources the particular interest

L7 ANSWER 4 OF 52 PQSCITECH COPYRIGHT 2024 ProQuest LCC on STN.

L7 ANSWER 10 OF 52 PQSCITECH COPYRIGHT 2024 ProQuest LCC on STN.

TI
UT

AB . . . materials with different bandgap energies (Si, Ge and SiC) and different isotope sources (Ni-63 and tritium) on the performance of **betavoltaic microbatteries**. Our simulation results indicate that a homojunction structure with wide bandgap semiconductor is more favorable for betavoltaic device performance. A. . .

TI Quantitative modeling of **betavoltaic microbattery** performance

UT **Betavoltaic microbattery**; Monte Carlo simulation; Electron-hole pair generation rate

Search Keywords and Numeric Properties together

```
=> S (?BETA? (T) ?VOLTAIC?) (5A) ?BATTER? AND 200-500NM/LEN
```

```
666666 ?BETA?
```

```
92246 ?VOLTAIC?
```

```
195110 ?BATTER?
```

```
52 (?BETA? (T) ?VOLTAIC?) (5A) ?BATTER?
```

```
291338 200-500NM/LEN
```

```
L10 6 (?BETA? (T) ?VOLTAIC?) (5A) ?BATTER? AND 200-500NM/LEN
```

Search Refinement:

Use numeric property requirements to retrieve batteries with a deposition layer thickness between 200-500nm.

KWIC shows hit terms and NPS results

L10 ANSWER 1 OF 6 PQSCITECH COPYRIGHT 2024 ProQuest LCC on STN.

AB L10 ANSWER 2 OF 6 PQSCITECH COPYRIGHT 2024 ProQuest LCC on STN.

AB Among the various micro-powers being investigated, **betavoltaic**


L10 ANSWER 6 OF 6 PQSCITECH COPYRIGHT 2024 ProQuest LCC on STN.

TI AB Gallium Nitride (GaN) Schottky **betavoltaic** nuclear **batteries** (GNBB) are demonstrated in our work for the first time. GaN films are grown on sapphire substrates by metalorganic chemical. . . nA cm super(-2). The limited performance of the GNBB is due to thin effective energy deposition layer, which is only **206** nm to absorb very small partial energy of the beta particles because of the relatively high dislocation density and carrier. . .

TI Gallium Nitride Schottky **betavoltaic** nuclear **batteries**


BIB Display includes FTDOI

L4 ANSWER 2 OF 39 PQSCITECH CO
AN 2023:484814 PQSCITECH Fu
DN 2893174583
TI Limit Efficiency of a Silic
AU Evstigneev, Mykhaylo ; Evst
Sokolovskyi, Igor
SO Micromachines, Vol. 14, No.
DOI: <https://doi.org/10.3390>
Published by: MDPI AG, Base
DT **Journal**; Article
LA English
ED Entered STN: 27 Dec 2023
Last updated on STN: 27 Dec

IK Order Article Reprints 

Open Access Article

Limit Efficiency of a Silicon Betavoltaic Battery with Tritium Source

by Mykhaylo Evstigneev ^{1,*} , Mohammad Afkani ¹ and Igor Sokolovskyi ²

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* Author to whom correspondence should be addressed.

Micromachines **2023**, *14*(11), 2015; <https://doi.org/10.3390/mi14112015>

Submission received: 30 September 2023 / Revised: 25 October 2023 / Accepted: 27 October 2023 / Published: 29 October 2023

(This article belongs to the Special Issue **Advanced Functional Materials for Energy Harvesting and Storage Devices, Volume II**)

Download Browse Figures Review Reports Versions Notes

Use PQSCITECH with other files to expand searches

```
=> FIL REG
```

```
=>
```

```
Uploading structure file: 2021_0149_Structure
```

```
L1      STRUCTURE UPLOADED
```

```
=> S L1 SSS SAM
```

```
L2      50 SEA SSS SAM L1
```

```
=> S L1 SSS FUL
```

```
L3      166203 SEA SSS FUL L1
```

Search Strategy:

Start with a standard structure search in REGISTRY to retrieve substances of interest.

NPS crossfile searching in files without RN indexing:

=> FILE PQSCITECH

FILE 'PQSCITECH' ENTERED AT 11:20:21 ON 23 AUG 2021
COPYRIGHT (C) 2021 ProQuest LLC. All rights reserved.
CHARGED TO COST=OFF

FILE LAST UPDATED: 29 JUL 2021 <20210729/UP>
FILE COVERS 1962 TO DATE

>>> SIMULTANEOUS LEFT AND RIGHT TRUNCATION AVAILABLE IN THE
BASIC INDEX (/BI), ABSTRACT (/AB), and TITLE (/TI) FIELDS <<<

YOU HAVE NEW MAIL

=> S L3

SUBSTANCE QUERIES NOT VALID IN THIS FILE

The logic expression entered contains L#s or saved query names which correspond to structures built by the STRUCTURE command or to screen sets. These must be searched in a substance file such as the REGISTRY file. In some files you may use a Registry Number answer set from a structure search as a search term or profile in some bibliographic file containing Registry Numbers, e.g. the CA file. For an explanation, enter " **HELP CROSSOVER** " at an arrow prompt (=>).

Search Tip:

PQSCITECH does not have RN indexing
so a REGISTRY L# crossover is not valid.

Instead, TRANSFER from a file with RN indexing:

TRANSFER AU and JT from CAplus, DUP ONLY

=> FILE CAPLUS

=> S L3 AND NONPATENT/DT

L12 189 L3 AND NONPATENT/DT

=> FILE PQSCITECH

=> TRA L12 AU

L13 TRANSFER L12 1- AU : 773 TERMS

L14 187958 L13

L15 QUE TERMS FROM L13 WITH NO HITS: 81 TERMS

=> TRA L12 JT

L16 TRANSFER L12 1- JT : 129 TERMS

L17 290721 L16

L18 QUE TERMS FROM L16 WITH NO HITS: 57 TERMS

=> S L14 AND L17

L19 9066 L14 AND L17

Search Strategy:

- SEARCH the RNs in CAplus.
- Refine to nonpatent documents.
- TRANSFER the Author names.
- TRANSFER the Journal Titles.
- Combine results.

DUP ONLY retrieves only overlapping documents

```
=> S L19 AND ((HOMO OR (HIGH? (4W) ORBITAL)) (S) ENE>0.15 EV)
```

```
L20          50 L19 AND ((HOMO OR (HIGH? (4W) ORBITAL)) (S) ENE>0.15 EV)
```

```
=> DUP ONLY L12 L20
```

```
FILES 'CAPLUS, PQSCITECH' ENTERED AT 11:24:34 ON 23 AUG 2021  
ALL COPYRIGHTS AND RESTRICTIONS APPLY.  SEE HELP USAGETERMS FOR DETAILS.  
CHARGED TO COST=OFF
```

```
2 FILES IN THE FILE LIST
```

YOU HAVE NEW MAIL

```
PROCESSING COMPLETED FOR L12
```

```
PROCESSING COMPLETED FOR L20
```

```
L21          8 DUP ONLY L12 L20
```

```
=> FIL PQSCITECH
```

```
=> S L21
```

```
L22          4 S L21
```

Search Strategy:

- Refine results with NPS.
- DUP ONLY to identify the publications that are in both the CAPLUS results and the PQSCITECH results.
- Note: these steps can be performed in reverse order, but DUP ONLY is time consuming with large answer sets.
- Re-enter PQSCITECH to retain hit term highlighting for the NPS.

L23 ANSWER 1 OF 4 PQSCITECH COPYRIGHT 2021 ProQuest LCC on STN.

ACCESSION NUMBER: 2016:599524 PQSCITECH Full-text

DOCUMENT NUMBER: PQ0002666466

TITLE: Synthesis of a dibenzothiophene/carboline/carbazole hybrid bipolar host material for green phosphorescent OLEDs

AUTHOR(S): Jun, Jin-Woo; Lee, Kyung-Mi; Kim, Oh Young; Lee, Jun Yeob; Hwang, Seok-Ho

CORPORATE SOURCE: Department of Polymer Science & Engineering, Dankook University, Yongin, Gyeonggi 18690, South Korea

SOURCE: Synthetic Metals. Vol. 213, pp. 7-11. Mar 2016.

ISSN: 0379-6779

DOI: 10.1016/j.synthmet.2015.12.022

Published by: Elsevier B.V., P.O. Box 211 Amsterdam 1000 AE Netherlands

PUBL. ITEM IDENTIFIER: 10.1016/j.synthmet.2015.12.022

DOCUMENT TYPE: Journal; Article

FILE SEGMENT: METADEX (MD)

LANGUAGE: English

SUMMARY LANGUAGE: English

ENTRY DATE: Entered STN: 17 Jun 2016

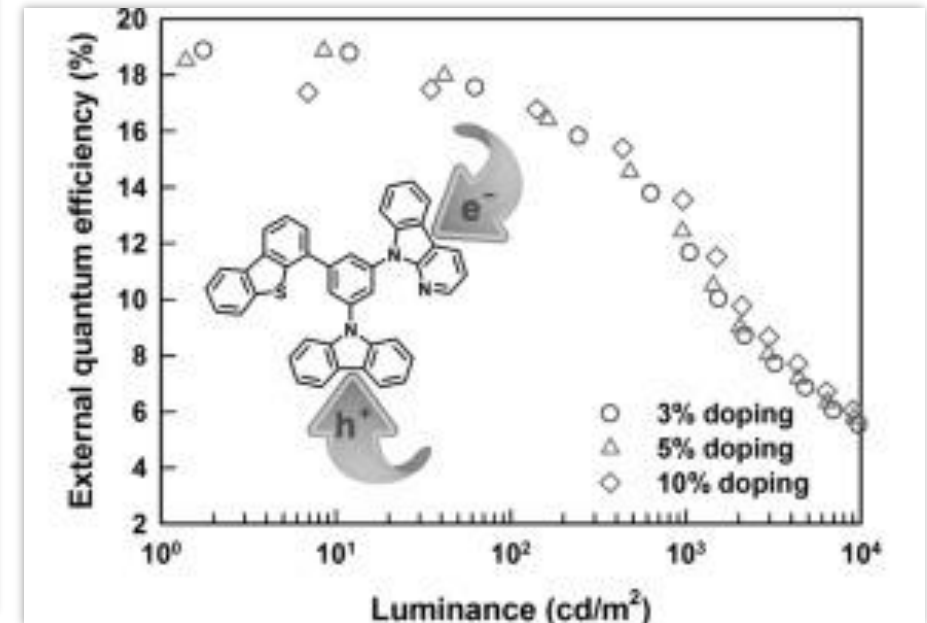
Last updated on STN: 17 Jun 2016

AB A bipolar host material for green phosphorescent organic light-emitting diodes (OLEDs) was designed and synthesized through a combination of dibenzothiophene, alpha -carboline, and carbazole (DTCC) moieties. The synthesized host material showed a sufficient HOMO/LUMO bandgap (3.49eV) and triplet energy (2.67eV) for green emitting bis[2-(2-pyridinyl-N)phenyl-C] (acetylacetonato) iridium(III) [Ir(ppy)2(acac)]. From the results of a single charge device for DTCC, the hole current density of DTCC was similar to the electron current density, indicating that DTCC possesses bipolar charge transport properties, confirming its bipolar nature and thus its applicability as the host of PHOLED. Thus, the DTCC host showed efficient energy transfer to the Ir(ppy)2(acac) dopant in the device. A maximum external quantum efficiency of 18.9% was obtained using DTCC as the host material and the color coordinate of the green PHOLED was (CIE x,y =0.34, 0.62) at 10% doping concentration.

AU Jun, Jin-Woo; Lee, Kyung-Mi; Kim, Oh Young; Lee, Jun Yeob; Hwang, Seok-Ho

JT Synthetic Metals

Hit term highlighting shows the AU and JT terms from the TRANSFER steps as well as NPS hit results.



Summary

- PQSCITECH is a large collection of scientific publications from a broad range of subject areas
- Features including Numeric Property Searching (NPS) and controlled terminology add value to records and facilitate searching
- Integrated DOIs link database record to original documents and/or options for obtaining them
- PQSCITECH can be searched alongside other CAS STNext files to add depth and recall to technology searches

For more information...



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