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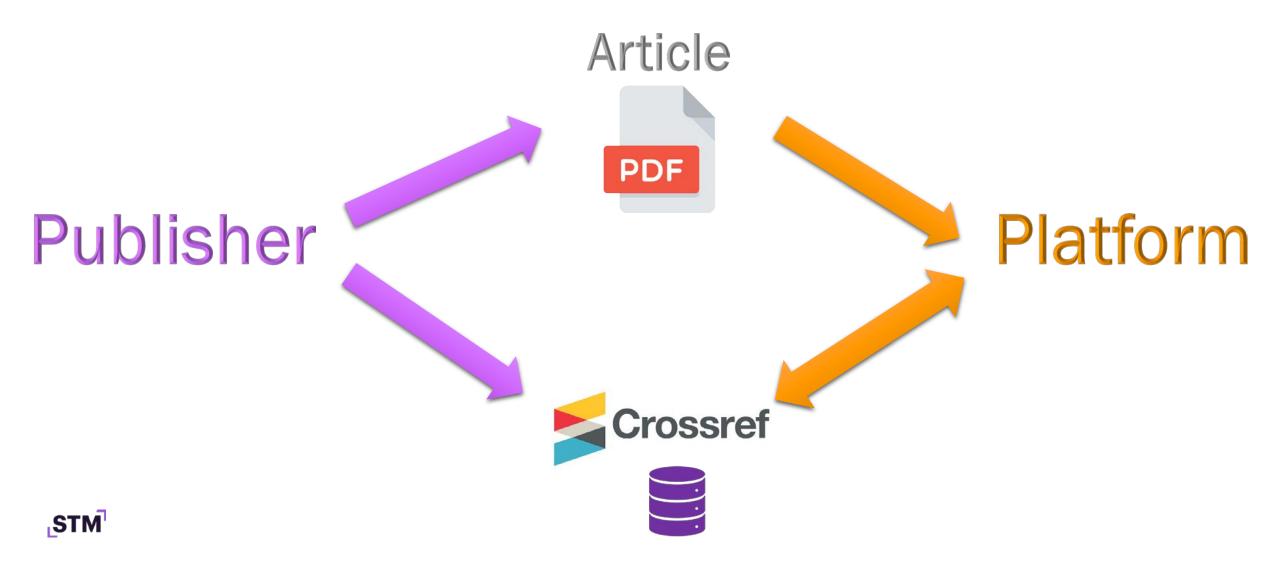
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STM Article Sharing Framework - Implementation

Dan O'Brien, American Chemical Society April 2021





Add Article Identifiers to PDF

Publisher

Deposit Sharing
Policy Indicators





Identifiers from PDF

Platform

Look for Sharing Policy Indicators







Add Article Identifiers to PDF

Publisher

Deposit Sharing
Policy Indicators

Article



Extract Article
Identifiers from PDF

Platform

Look for Sharing Policy Indicators







Two fields

- Article DOI
- Journal Article Version ("JAV")



Two encoding methods

Two implementation methods

More on JAV

JAV defined as NISO recommended practice RP-8-2008

https://www.niso.org/publications/niso-rp-8-2008-jav

Supported JAV values within this framework:

- VoR Version of record
- AM Accepted Manuscript
- AO Author Original



Two fields:

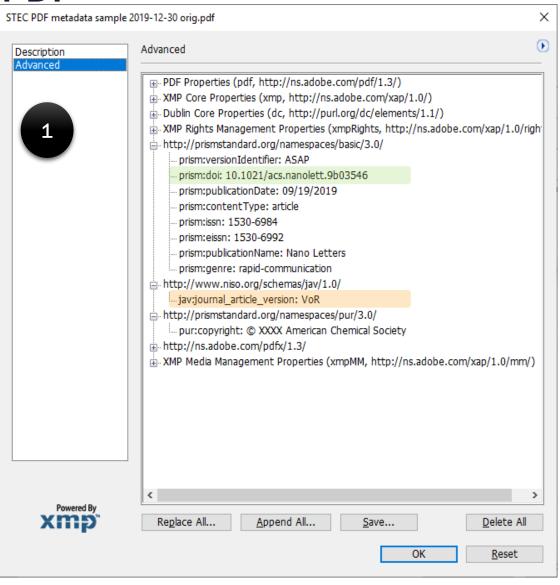
- Article DOI
- Journal Article Version

Two encoding methods

- 1. Add to PDF's XMP metadata section
- 2. Add JAV to DOI hyperlink

Two implementation methods





Two fields:

- Article DOI
- Journal Article Version

Two encoding methods

- 1. Add to PDF's XMP metadata section
- 2. Add JAV to DOI hyperlink

Two implementation methods



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Received: June 26, 20
Accepted: August 28,

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Article

Analysis of the Partial Nitrification Process Affected by Polyvinylchloride Microplastics in Treating High-Ammonia Anaerobic Digestates

Kang Song, Zhouyang Li, Dan Liu, and Lu Li*





ACCES

III Metrics & More

Article Recommendations

Supporting Information

ABSTRACT: Large amounts of microplastics entering into wastewater treatment plants are retained as wasted sludges, which are usually transferred to the anaerobic digestion process afterward. The partial nitrification (PN) process is known for treating the high ammonia anaerobic digestate; its treatment performance that is affected by the existence of microplastics is rarely reported. This study investigated the effect of microplastics is rarely reported. This study investigated the effect of microplastics is rarely reported. This study investigated the effect of microplastics is rarely reported. This study investigated the effect of microplastics at 0, 1000, 5000, and 10,000 particles/I. Results indicated that the corresponding nitrite transfer rates with the existence of PVC were 90.97, 64.24, 52.88, and 46.66%. The ammonia oxidation rate was reduced to 0.69, 0.55, and 0.49 times as compared with control. The average dissolved nitrous oxide (N₂O) emission was also mitigated to 0.58, 0.49, and 0.64 times with added microplastics as compared with control. The first-order kinetic model fitted well with all tests. The highest NO₂-N generation potential was found in the blank reactor at a coefficient of 1430.1 (R² = 0.9776), which was 1.9–2.3 times higher



than the other reactors with added microplastics. This study indicated that PVC inhibited the PN process and mitigated N₂O emission during such a process. The microplastic contamination effects on high-ammonia wastewater treatment during the PN process must be considered for investigation.

1. INTRODUCTION

ACS Publications

Abundant microplastics produced by human activities are received by municipal wastewater treatment plants, and majority of these microplastics end up in wasted sludges. $^{1-4}$ Over 90% of microplastics are rejected in WWTPs around the world. Sun et al. reviewed microplastic abundance in the different sewage sludges of WWTPs from nine countries and reported that the concentration ranged from 50 to 170,900 particles/kg of dry sludge.5 Mahon et al. revealed that microplastic abundance changes after different sludge treatment processes and reported that anaerobic digestion can contribute to microplastic reduction.6 Li et al. investigated 79 sludge samples from 28 WWTPs in China and reported that the average microplastic abundance was $22.7 \pm 12.1 \times 10^3$ particles/kg of dry sludge. Approximately 1.56 × 10¹⁴ microplastic particles are annually discharged to the environment from the Chinese sludge Meanwhile, the microplastic effect on the anaerobic digestion process has aroused growing concern. Wei et al. revealed that the existence of polyvinylchloride (PVC) microplastics can reliase bisphenol-A and inhibit methane production during anaerabic digestion with PVC concentration higher than 20 particles/g TS.8 Fu et al. found that the exposure to nanoplastics also leads to inhibition in the anaerobic digestion process.9 Such an inhibition shows a positive correlation with nanoplastic abundance. Large amounts of microplastics in anaerobic slugge

remain in the anaerobic digestate after digestion and thus can affect the next step, that is, the biological treatment process.

Some earlier studies conducted the investigation of microplastics' impact on the biological treatment process. Li et al. investigated the effect of microplastics on the conventional activated sludge nitrification and denitrification process (NH4-N, 40 mg/L). It is reported that microplastics with concentration lower than 10,000 particles/L in wastewater had low effect on nitrification and denitrification within a 3 h test.1 Qin et al. studied the microplastic polyether sulfone (PES) exposure to the nitrifying process (NH4Cl, 120 mg/L) of aerobic granular sludge, of which results indicated nitrite oxidase performance was inhibited with the addition of PES. 11 Partial nitrification (PN) is regarded as an energy-saving prospective technology in treating high ammonia and low-carbon source wastewater, such as the anaerobic digestate. 12-14 In these wastewaters, the ammonia concentration was always no less than 1000 mg/L and even higher, and the microbe community

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https://dx.doi.org/10.1021/acsomega.0c03079 ACS Omega 2020, S, 23836—23842

https://doi.org/10.1021/acsomega.0c03079

https://doi.org/10.1021/acsomega.0c03079?ref=pdf&rel=cite -as&<mark>jav=VoR</mark>

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Quick Poll #2

Publishers:

Do you implement <u>any XMP</u> data in the PDF version of your articles today?



Two fields:

- Article DOI
- Journal Article Version

Two encoding methods

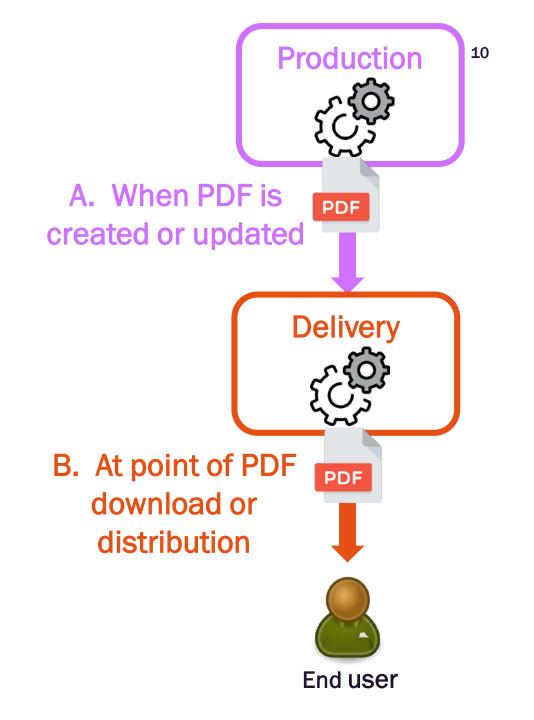
- 1. Add to PDF's XMP metadata section
- 2. Add JAV to DOI hyperlink

Two implementation methods

- A. PDF generation or update -OR-
- B. At delivery

Consideration: Frontfile vs Backfile

STM



Quick Poll #3

Publishers:

Have you already implemented **DOI** and **JAV** tagging in your article PDFs (XMP)?



Add Article Identifiers to PDF

Publisher

Deposit Sharing
Policy Indicators





Extract Article Identifiers from PDF

Platform

Look for Sharing Policy Indicators







Publisher: Sharing Policy Contexts

Four Sharing Policy contexts defined

Each with 2 to 4 values

Platform	pns	Platform that <u>has not signed</u> or does not comply with the STM Voluntary Principles for Article Sharing
Туре	ps	Platform that <u>has signed</u> and complies with the STM Voluntary Principles for Article Sharing
	ft	Full Text
Displayable	ab	Abstract
Elements	ref	References
	cm	Citation Metadata
	vor	Version of Record
JAV Article Version	am	Accepted Manuscript
Version	ao	Author's Original
Audience	ga	General Access
Scope	rcg	Research Collaboration Group



Publisher: Sharing Policy Indicators

Each permutation of sharing policy contexts = one STM sharing policy

Each policy has a unique identifier: a DOI expressed as a URI

- A "Sharing Policy DOI" (distinct from an Article DOI)
- STM is the "publisher", using STM's 10.15223 DOI prefix

#	Platf Ty		JAV Ar	rticle V	ersion		ience ope	Displayable Elements				
	pns	ps	vor	am	ao	ga	rcg	ft	ab	ref	cm	
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2	Х	*	Х			Х	*		Х		*	
3	Х	*	Х			Х	*			X	*	
4	Х	*	Х			Х	*				Х	
5	Х	*	Х				Х	Х	*	*	*	
6	Х	*	Х				Х		Х		*	
7	Х	*	Х				Х			Х	*	
8	Х	*	Х				Х				Х	
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10	х	*		Х		Х	*		Х		*	
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12	Х	*		Х		х	*				Х	

39	Х	Х			Х			Х	*
40	Х	Х			Х				Х
41	Х		Х	Х	*	Х	*	*	*
42	Х		Х	Х	*		Х		*
43	Х		Х	Х	*			Х	*
44	Х		Х	Х	*				Х
45	Х		Х		Х	Х	*	*	*
46	Х		Х		Х		Х		*
47	Х		Х		Х			Х	*
48	Х		Х		X				Х

STM ASF Policy DOI

Base:

https://doi.org/10.15223

https://doi.org/10.15223/policy-001 https://doi.org/10.15223/policy-002 https://doi.org/10.15223/policy-003 https://doi.org/10.15223/policy-004 https://doi.org/10.15223/policy-005 https://doi.org/10.15223/policy-006 https://doi.org/10.15223/policy-007 https://doi.org/10.15223/policy-008 https://doi.org/10.15223/policy-019 https://doi.org/10.15223/policy-010 https://doi.org/10.15223/policy-011 https://doi.org/10.15223/policy-011

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Publisher: Deposit Sharing Policy Indicators to Crossref

Subscription incl open RCG (collaboration group) GA (public and requested access) Audience Scope --> archive Elsevier's Displayable element --> ASF **REF ASF** FT CM REF policy (references policy AB AB FT CM sharing policy Platform type Document version (full text) (citations) (references) (abstract) (full text) (citations) (abstract) AO (preprint) Allowed Allowed Allowed Allowed Allowed Allowed Allowed Allowed 041 PS (signed & complies for subscription Allowed Allowed AM (accepted manuscript) Allow 037 'owed Allowed Disallowed 034 Allowed Disallowed with principles) llov 4 VOR (version of record, incl proofs) Allowed Allowed Allowed 029 Allowed 026 Allowed isallowed articles AO (preprint) iowea ulowed Allowed Allowed Allowed Allowed Allowed wea 021 017 PNS (not signed & All ed Allowed AM (accepted manuscript) Disallowed <mark>014</mark> Allowed Disallowed bisallowed 010 complies with principles VOR (version of record, incl or Allowed lowed isallowed <mark>006</mark> Allowed 002 Allowed

ACS' sharing policy for subscription articles

ASF (collaboration Policy Subscription (n -OA) group) AΒ FT CM REF Displayable element --> Platform type Dock nent version AO (submitted mss) 045 PS (signed & compli AM (accepted manuscript) 037 principles) VOR (version of record, incl proofs) 029

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AO (submitted mss)	N	N	Υ	N
AM (accepted manuscript)	N	N	Υ	N
VOR (version of record, incl proofs)	N	N	Υ	N

N	N	Υ	N
N	N	Υ	N
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Publisher: Deposit Sharing Policy Indicators to Crossref

Only a few policies DOIs needed to convey a Publisher's sharing policy for an article.

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	х	Х				Χ	Х				https://doi.org/10.15223/policy-029
	Х		Х		Х		Х				https://doi.org/10.15223/policy-033

Leverages same "licenseref" structure in Crossref used for Open Access and CHORUS

(NISO Access & License Indicators)

One article DOI can contain multiple sharing policy DOIs.





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<license_ref>https://doi.org/10.15223/policy-002</license_ref>
<license_ref>https://doi.org/10.15223/policy-029</license_ref>
<license_ref>https://doi.org/10.15223/policy-033</license_ref>
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Quick Poll #4

Publishers:

Do you already deposit any "license_ref" metadata to Crossref, for example in support of CHORUS?



Add Article
Identifiers to PDF

Publisher

Deposit Sharing
Policy Indicators





Extract Article Identifiers from PDF

Platform

Look for Sharing
Policy Indicators







Platform: Extract DOI & JAV from PDF

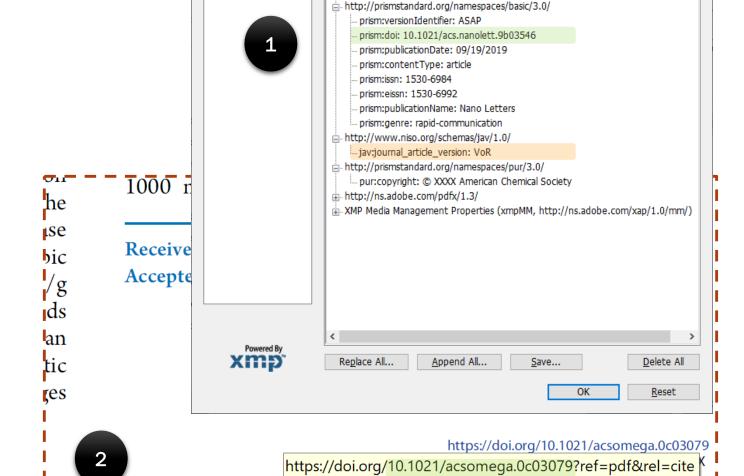
Two fields

- Article DOI
- Journal Article Version

Both methods can be automated:

- 1. PDF's XMP metadata section
- 2. JAV within DOI hyperlink

ACS developed a proof of concept to illustrate, source code freely available



-as&iav=VoR

STEC PDF metadata sample 2019-12-30 orig.pdf

Description

Advanced

PDF Properties (pdf, http://ns.adobe.com/pdf/1.3/)
 XMP Core Properties (xmp, http://ns.adobe.com/xap/1.0/)
 Dublin Core Properties (dc, http://purl.org/dc/elements/1.1/)

MP Rights Management Properties (xmpRights, http://ns.adobe.com/xap/1.0/rights/



Add Article
Identifiers to PDF

Publisher

Deposit Sharing
Policy Indicators



PDF

Extract Article
Identifiers from PDF



Crossref Look for Sharing Policy Indicators





Platform: Look for Sharing Policy Indicators in Crossref

Platform determines the requested

sharing context

Extracted from PDF

Article DOI: 10.1021/acs.nanolett.9b03546

JAV: VOR

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Crossref has several metadata services and APIs

Example: Crossref REST API

https://api.crossref.org/works/{doi}



Platform: Look for Sharing Policy Indicators in Crossref

Platform determines the requested

sharing context

Extracted from PDF

Article DOI: 10.1021/acs.nanolett.9b03546

JAV: VOR

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Crossref has several metadata services and APIs

Example: Crossref REST API

https://api.crossref.org/works/{doi}







Platform: Look for Sharing Policy Indicators in Crossref

Platform determines the requested sharing context

Extracted from PDF

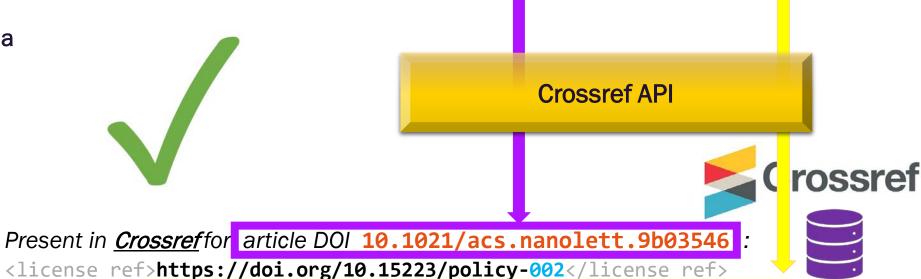
Article DOI: 10.1021/acs.nanolett.9b03546

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Lookup to Crossref reveals a match...

Article may be shared.





<license_ref>https://doi.org/10.15223/policy-002</license_ref>
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Platform: Look for Sharing Policy Indicators in Crossref

Platform determines the requested sharing context

Extracted from PDF

Article DOI: 10.1021/acs.nanolett.9b03546

JAV: VOR

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Lookup to Crossref reveals no match...

Article may not be shared.



Crossref API

Present in <u>Crossref</u> for article DOI 10.1021/acs.nanolett.9b03546

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<license_ref>https://doi.org/10.15223/policy-029</license_ref>

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Implementation Recap

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Extract Article Identifiers from PDF

Platform

Look for Sharing Policy Indicators





Resources

https://www.stm-assoc.org/asf/

- Implementation Guide
- FAQ
- Policy Information & lookup tool (spreadsheet)

Questions? asf@stm-assoc.org

Special Thanks

- Vincent Lizzi, Taylor & Francis
- Mirjam Kessler, Springer Nature
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- Patricia Feeney, Crossref
- Todd Carpenter, NISO
- Nettie Lagace, NISO
- Jeff Beck, NCBI/NLM/NIH
- Matt McKay, STM
- STEC Article Sharing Framework subgroup
- NISO ALI Revision working group

... and many more!

