**Faulty science citation examples**
Ian McCullough, January 19, 2017

These examples were prepared for a graduate class in research methods to show how poor citations make it difficult or impossible to find information. In each case the original citation is given without alteration, followed by the problem and the correction in ACS Style, 3rd edition.

Of specific importance is Example 5, citing PDF documents found online only by the URL. Given the fluidity of grey literature on the web such as product guides, white papers, and technical sheets for equipment this practice virtually guarantees the reference will be bad over the course of time.

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**Example 1**

16. Irom F., Farmanesh F.H., Swift G.M., et al. (2003) IEEE, pp. 1

Substantive problem:
I think they downloaded this from ResearchGate and never bothered to look up the actual paper (pp 1 is a hint that it's a preprint of some sort). IEEE is the publisher and you can infer this is a conference proceeding – but which conference?

Correct citation:

(16) Irom, F.; Farmanesh, F. H.; Swift, G. M.; Johnston, A. H.; Yoder, G. L. Single-Event Upset in Evolving Commercial Silicon-on-Insulator Microprocessor Technologies. *IEEE Trans. Nucl. Sci.* **2003**, *50*, 2107–2112.

**Example 2**

21. Minko S., Stamm, M., Ed. (2008) Polymer Surfaces and Interfaces, 215

Substantive Problem:
This is a book chapter authored by Minko in a collection edited by Stamm. The citation makes them look like co-editors of the book. Misunderstanding of book chapters is a frequent error.

Correct citation:

(21) Minko, S. Grafting on Solid Surfaces: ``Grafting to'' and ``Grafting from'' Methods. In *Polymer Surfaces and Interfaces: Characterization, Modification and Applications*; Stamm, M., Ed.; Springer Berlin Heidelberg: Berlin, Heidelberg, 2008; pp. 215–234.

**Example 3**

31. Alexander S.J. (1997) J. Phys., 38, 977

Substantive problem:
There are well over 100 journal titles that include "J. Phys." – this is utterly worthless as a journal indicator. J. Phys. Usually means Journal de Physique from Paris and newer titles are J. Phys. I or J. Phys. II. But older titles need to have the country identified. The current J. Phys. Is from Bangalore.

Correct citation:

(31) Alexander, S. Adsorption of Chain Molecules with a Polar Head a Scaling Description. *J. Phys. (Paris)* **1977**, *38*, 983–987.

**Example 4**

26 Guthrie, J.T. and Tait, J.*G., UV-curable coating from palm oil and derivatives, Surface coatings international*. J. Oil Colour Chem. Assoc., 2000. 83(6): p. 278

Substantive problem:
Ok, not very substantive, but this is an article formatted like a book.

Correct citation:

(26) Guthrie, J. T.; Tait, J. G.; Sagar, A. G. UV-Curable Coatings Form Palm Oil and Derivatives. *Surf. Coatings Int.* **2000**, *83*, 278–284.

**Example 5**

46 http://www.ciba.com/pi.pdf, accessed on October 19th 2008

49 http://www.sartomer.com/TechLit/5050.pdf, accessed on July 25th 2009

Substantive problem:
This is probably the single most serious issue I encounter – PDFs cited as URLs. Both of these links do not exist anymore. I was able to track both down via the web archive.org's Wayback Machine. The first is a product guide:

(46) Ciba Specialty Chemicals. *Photoinitiators for UV Curing: Key Products Selection Guide*; Basel, Switzerland, 2003.

The second was originally a conference paper from RadTech 2000 presented as a working paper at the above link – which is not online but I was able to search the private RadTech member article archive to find a citation:

(49) "UV Curable Laminating Adhesives", Deborah Sciangola, RadTech 2000, Baltimore Convention Center, Baltimore, Maryland, April 9-12, 2000.

ACS doesn't ask for URLs normally, but the one above is clarifying, so inclusion would be good.

**Example 6**

87. Hercouet, A.; Corre, M. *Phosphorus, Sulfur, and Silicon* **1990**, 279-280.

Not exactly a big deal, but this isn't the full title of the journal.

Correct Citaiton:

(87) Hercouet, A.; Corre, M. Le. A CONVENIENT SYNTHESIS OF ALKYLPHOSPHONIUM SALTS. *Phosphorus. Sulfur. Silicon Relat. Elem.* **1990**, *48*, 279–280.

**Example 7**

(40) Swearingen, S. Scanning Probe Microscopy Analysis of a Triblock Copolymer Pressure-Sensitive Adhesive with Chemically Modified Tip. **2005**.

This document does not exist. It is very close in title to several publications from Dr. Mark Foster's group at the University of Akron, but I don't know which one is meant and neither did he when asked.

**Example 8**

(126) Lee, N.-H. Extending Raman spectroscopy to the nanoscale. 2007.

Substantive problem:
This is a dissertation and should be cited as such. Minimally this includes the degree-granting institution and the date. Noting the degree awarded is also normal in ACS style.

Correct citation:
(126) Lee, N.H. Extending Raman Spectroscopy to the Nanoscale. Ph.D. Dissertation, The University of Akron, 2007.

**Example 9**

[86] Ellis G, Gomez MA, Marco C. The international journal of vibrational spectroscopy, vol. 5, 4th ed, Section 5.

Substantive problem:
The journal does not exist. They probably took a shortened citation (Int. J. Vibr. Spec.) and never bothered to look it up. In any case the Internet Journal of Vibrational Spectroscopy was real thing, but the site is down and the article is only available from the web archive.

Correct citation:

(86) Ellis, G., Gómez, M.A., Marco C. Mapping the crystalline morphology of isotactic polypropylene by infrared microscopy. *Internet J. Vib. Spectrosc*. **2001**, *5*, Edition 4, Section 5.

**Example 10**

(124) Brochard-Wyart, F.; de Gennes, P. G. *Adhesion Sci. Technol*. **1993**, *7*, 495-502.

Substantive problem:
They left the "J" off the journal title. This is a small error and normally no big deal, but has big consequences in this case because Google Scholar cannot parse the citation. Just putting "j." before adhesion corrects the search.

Correct citation:

(124) Brochard-Wyart, F.; De Gennes, P. G. Capillary Rise of a Liquid on a Solid Grafted with Long Polymer Chains. *J. Adhes. Sci. Technol.* **1993**, *7*, 495–502.

**Example 11**

30. Puskas, J. E.; Kaszas, G., *Prog. Polym. Chem*. **1998**, *36*, 1686.

Substantive problem:
What a mess - this article doesn't exist. This is an example of citations getting garbled together, probably from cut and paste. The most similar is from a Puskas paper:

Kim, Y. H. *J. Polym. Sci., Part A: Polym. Chem*. **1998**, *36*, 1686.

Unfortunately, this is also a wrong citation (in Macromolecules no less). It should be:

(30) Kim, Y. H. Hyperbranched Polymers 10 Years after. *J. Polym. Sci. Part A Polym. Chem.* **1998**, *36*, 1685–1698.

However, the one page off prevents Google Scholar from figuring it out.

It could also be the only article written by Puskas and Kaszas in Progress in Polymer Science:

(30) Puskas, J. E.; Kaszas, G. Living Carbocationic Polymerization of Resonance-Stabilized Monomers. *Prog. Polym. Sci.* **2000**, *25*, 403–452.

Contextually, the author is discussing polymer branching, so I would guess the Kim article. That said you should never have to guess what a citation is citing.

**Example 12**

Two from the same dissertation without journal title. Probably *Macromolecules*.
75. Kee, R. A.; Gauthier, M., **1999**, *32*, (20), 6478-6484.
76. Yuan, Z. S.; Gauthier, M., **2005**, *38*, (10), 4124-4132.

**Example 13**

68. J. Stevenson, P. G. Wolynes, *cond-mat*/0609677 (2006).

Substantive problem:
Incorrect and incomplete preprint server citation. Correct format in ACS Style Guide, p. 319.

Correct citation:

(68) Stevenson, J. D.; Wolynes, P. G. Comparison of Some Recent Excitation Chain Arguments with the Random First Order Transition Theory of Supercooled Liquids and Experiment. 2006, arXiv:cond-mat/0609677. arXiv.org e-Print archive. https://arxiv.org/abs/cond-mat/0609677 (access Dec 1, 2016).

**Example 14**

82. Tracz, A.; Jeszka, J.; Watson, M.; Pisula, W.; Műllen, K.; Pakula, T. *J. Am. Chem. Soc.* 2003, 125, 1692.

Substantive problem:
Wrong authors or wrong journal/volume. Since that list of author do not appear in Google Scholar for any work ever, I would assume they messed up that aspect of the citation.

Correct citation:

(1) Boezio, A. A.; Charette, A. B. Catalytic Enantioselective Addition of Dialkylzinc to N - Diphenylphosphinoylimines. A Practical Synthesis of α-Chiral Amines. *J. Am. Chem. Soc.* **2003**, *125* (7), 1692–1693 DOI: 10.1021/ja027673x.

(Note this last one has the DOI included. Most of the individual ACS journals require this although it is not quite universal.)