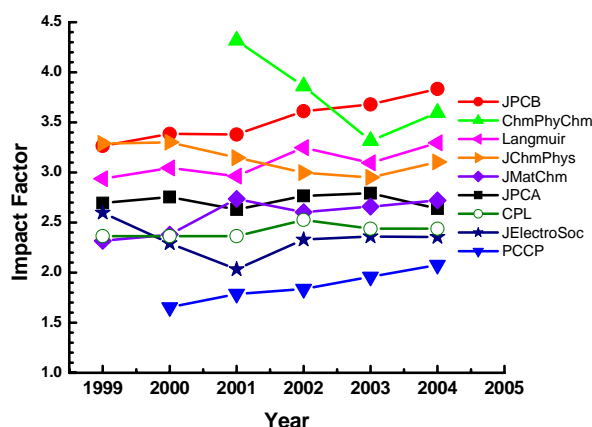
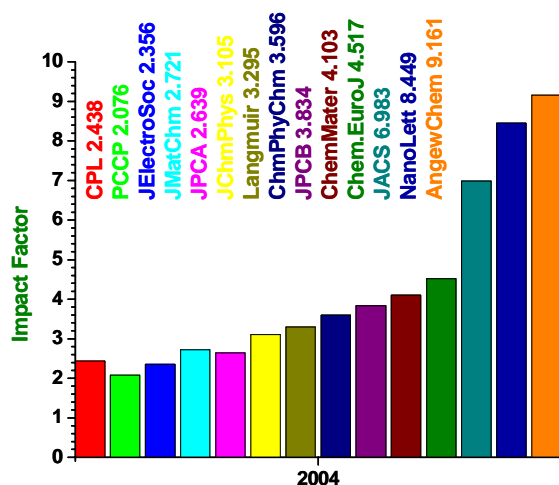


## Journal Impact Factor. Does it reflect the impact of Cited Papers?

The increased publicity of Impact Factor of scientific journals has led to some misgivings among the scientific community. Read recent Nature article "Not-so-deep impact: Research assessment rests too heavily on the inflated status of the impact factor" [Nature Vol. 435, 1003](#) (23 June 2005). ".....For example, we have analyzed the citations of individual papers.in Nature and found that 89% of last year's figure was generated by just 25% of our papers. ...."

Comparison of Impact Factors (2004)

Source: ISI Web of Science



The impact factors of the scientific journals are determined from the short term citations (two previous years). It reflects the impact of the journal based on the overall citations of previous two years. Increase or decrease in number of published papers in a given year, time required to publish articles and publication of popular review articles indirectly influence the *Impact Factor* of each journal. It does not reflect impact of published work during the defined period. It is important to know how the published work makes an impact over a longer period of time.

## Citation Frequency of Published Papers in Physical Chemistry Journals

In order to assess the real impact of published work, a citation frequency has been determined for selected journals for 3 different periods: **1. Short range (2002-2004); 2. Medium range (1998-2004) and 3. Long range (1975-2004)**. The impact factor of these journals vary from 2 - 9. (These journals are chosen from the lists that are of interest to physical chemists. Two prime journals J. Am. Chem. Soc. and Angew. Chem. were also included in the comparison.) The fraction of the published papers that show significant citations (25, 50 or 100+ citations); moderate citations (10+ citations) and 0 citations are compared for these three different periods.

Citation Frequency = Number of Papers with “X” citations/Total Number of Published Papers ×100

where “X” represents papers with at least 100, 50, 25, 10 or no citations.

The 3 tables and charts below show the number of published work and three *citation frequencies* (or fractions of cited work) analyzed on the basis of the following criteria.

- A. Fraction of published work is considered to be of **high impact** if the published work has at least 25 (short range), 50 (medium range), and 100 (long range) citations
- B. Fraction of published work is considered to be **moderate impact** if it carries at least **10 citations**
- C. Fraction of published work with **no impact** if it has **zero citations**

For comparison of 30 most cited articles in these journals during the 3 periods chosen in this study, please refer to <http://www.nd.edu/~pkamat/citations/citations.html>

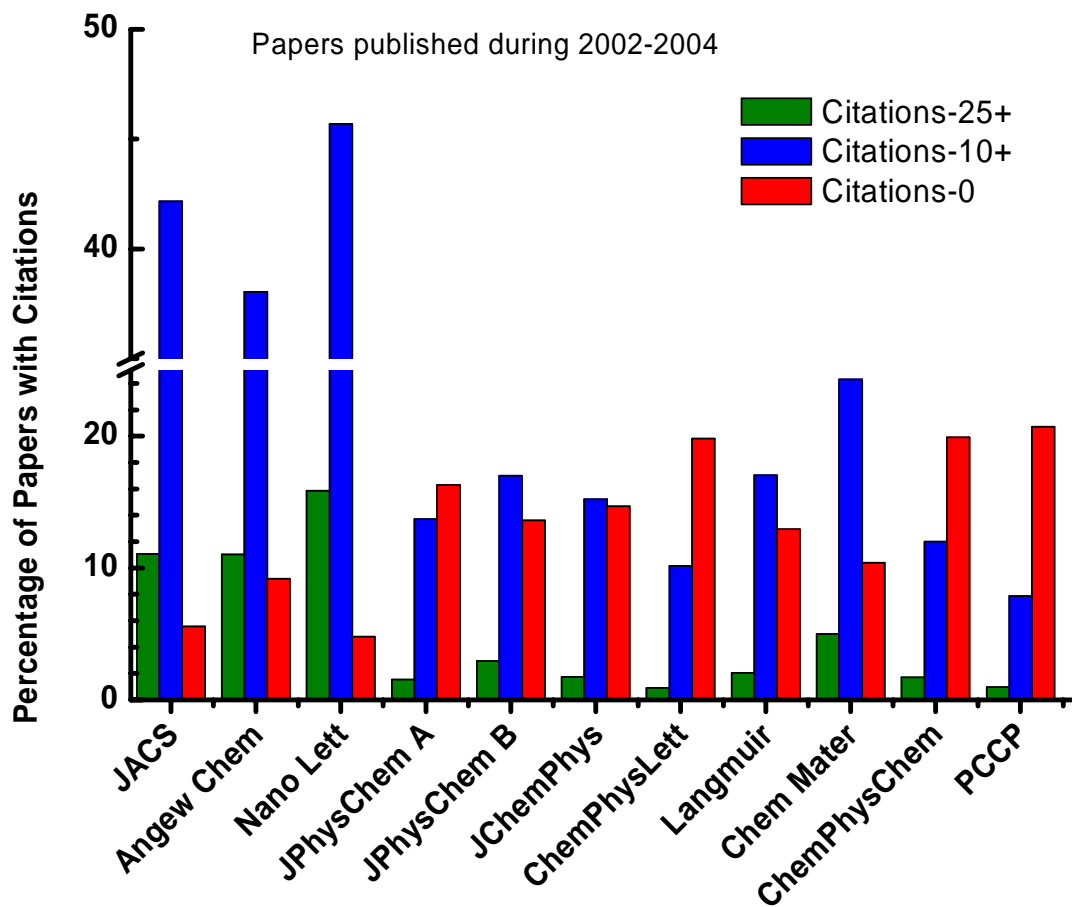
Few key points emerge from this analysis

- During the short citation period the *Citation Frequency* of high impact papers follow the trend of journal *Impact Factor*. At least 11% of the papers published JACS, Angew Chem. and Nano Letters have high impact and 38-45% of published papers have moderate impact. The relevance of papers to the popular topics makes the impact of these papers quite high in the short time period. Both JACS and Nano Letters show higher *citation frequency* impact for the period 2002-2004 than Angew Chem. in all 3 categories. (Note: According to ISI evaluation, Angew Chem. has the highest *impact factor* of 9.161 in 2004!)

- For journals specialized in Physical Chemistry/Chemical Physics, 10-20% of the papers remain uncited during 2002-2004, but this fraction drops to ~5% if the citation period is extended to longer period. During the period 1998-2004, these journals show larger fraction of cited papers of higher and moderate impact. Both ChemPhysChem and PCCP continue to show larger fraction of uncited work during this period. It is evident that the papers published in these journals need additional time to get recognition.
- The difference between various journals narrows when the citation period is extended to 30 years. The only exception is JACS which retains its major impact with relatively high fraction of cited work in the high impact (8.1%) and moderate impact (81%). The impact of JACS is interesting since it does not publish review articles. Other journals show a citation frequency of moderate impact papers corresponding to 40-60% of published papers during this period.
- Irrespective of the journal impact factor, all journals carry a fraction of about 5% with No Impact.
- JACS, J. Phys. Chem. and J. Chem. Phys. lead the pack in publishing highest number of papers that have been cited more than 100 citations during the last 30 year period. (30 most cited articles in various journals are listed on the webpage:  
<http://www.nd.edu/~pkamat/citations/citations.html>)

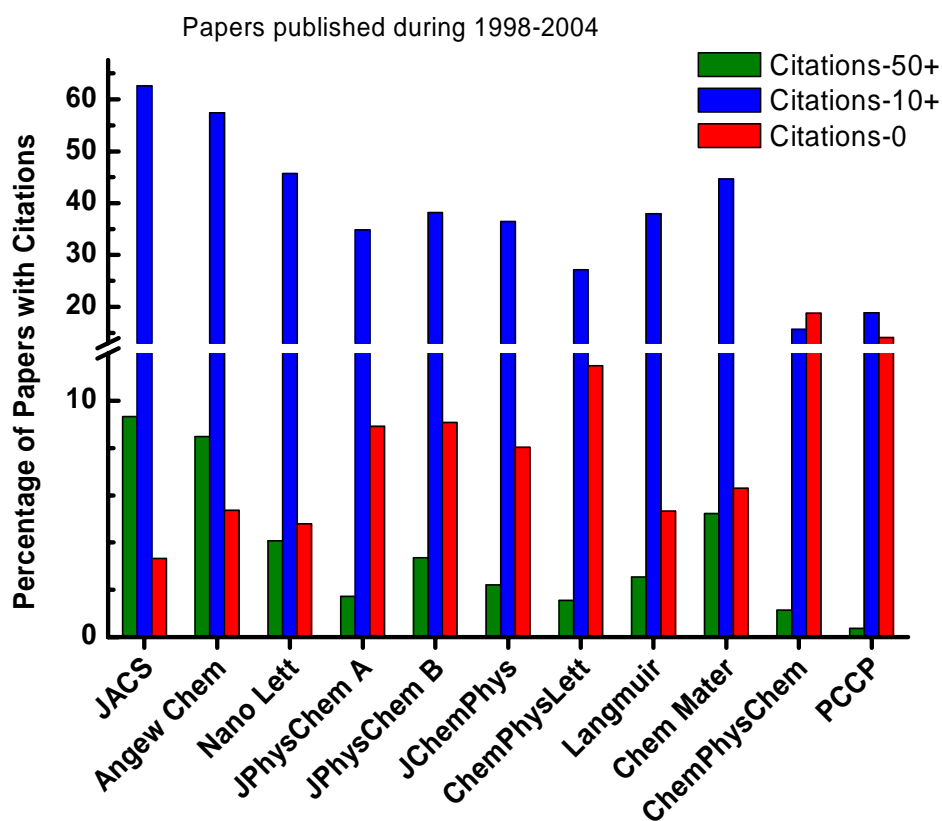
## 1. Citation Frequency of Papers Published during 2002-2004

Journal	Total papers	Papers with 25+ Citations		Papers with 10+ Citations		Papers with No Citations	
		No.	%	No.	%	No.	%
J. Am. Chem. Soc.	8820	975	11.05	3719	42.17	492	5.58
Angew. Chem.	3363	371	11.03	1279	38.03	309	9.19
Nano Lett.	1230	195	15.85	562	45.69	59	4.79
J. Phys. Chem. A	4460	69	1.55	611	13.70	726	16.28
J. Phys. Chem. B	6382	189	2.96	1085	17.00	869	13.62
J. Chem. Phys.	8054	140	1.74	1225	15.21	1182	14.68
Chem. Phys. Lett.	4778	43	0.90	485	10.15	947	19.82
Langmuir	4867	99	2.03	828	17.012	629	12.92
Chem. Mater.	2259	113	5.00	549	24.30	235	10.40
ChemPhysChem	583	10	1.72	70	12.00	116	19.90
PCCP	2493	24	0.96	196	7.86	516	20.70



## 2. Citation Frequency of Papers Published during 1998-2004

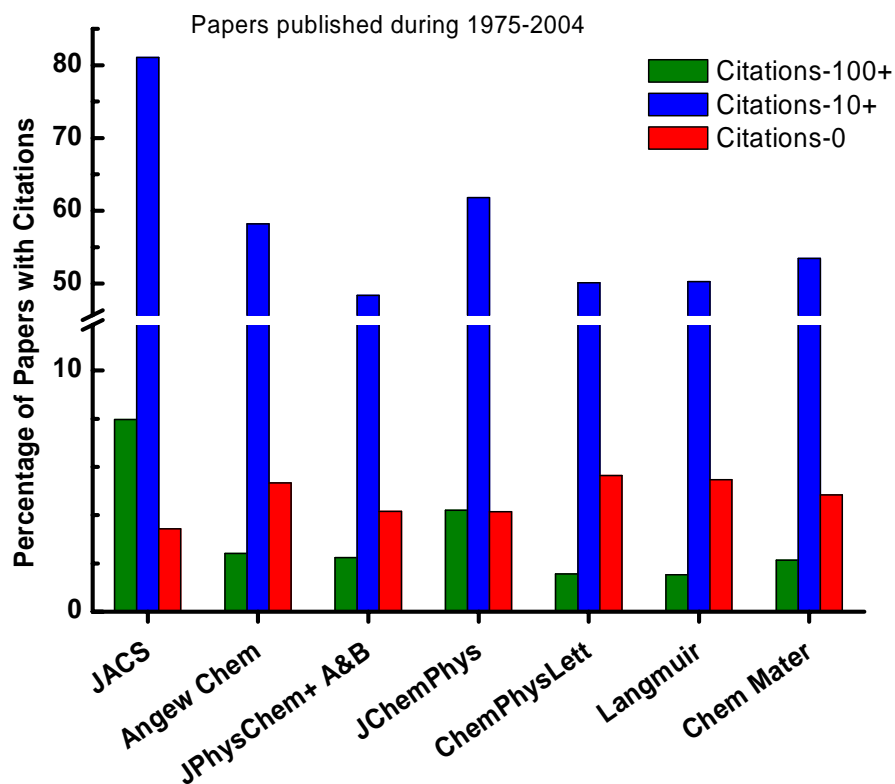
Journal	Total papers	Papers with 50+ Citations		Papers with 10+ Citations		Papers with No Citations	
		No.	%	No.	%	No.	%
J. Am. Chem. Soc.	17967	1676	9.33	11248	62.60	597	3.32
Angew. Chem.	6906	586	8.483	3965	57.41	370	5.36
Nano Lett.	1230	50	4.063	562	45.69	59	4.80
J. Phys. Chem. A	10458	179	1.713	3646	34.86	932	8.91
J. Phys. Chem. B	12799	430	3.36	4885	38.17	1161	9.07
J. Chem. Phys.	18412	405	2.20	6704	36.41	1477	8.02
Chem. Phys. Lett.	10706	167	1.56	2906	27.14	1230	11.49
Langmuir	10161	257	2.53	3853	37.92	541	5.32
Chem. Mater.	4670	244	5.22	2083	44.60	294	6.29
ChemPhysChem	707	8	1.13	111	15.70	133	18.81
PCCP	4961	18	0.36	937	18.89	698	14.07



Please note that the journals Nano Letters and ChemPhysChem were launched in the years 2001 and 2000 respectively. These journals do not reflect citation frequency for the entire period starting 1998.

### 3. Citation Frequency of Papers Published during 1975-2004

Journal	Total papers	Papers with 100+ Citations		Papers with 10+ Citations		Papers with No Citations	
		No.	%	No.	%	No.	%
J. Am. Chem. Soc.	64921	5169	7.96	52630	81.07	2227	3.43
Angew. Chem.	7056	170	2.41	4107	58.21	376	5.33
J. Phys. Chem. + A&B	66718	1497	2.24	32262	48.36	2779	4.17
J. Chem. Phys.	63538	2670	4.20	39274	61.81	2632	4.14
Chem. Phys. Lett.	39196	610	1.56	19646	50.12	2212	5.64
Langmuir	16973	260	1.53	8536	50.29	930	5.48
Chem. Mater.	7122	152	2.13	3808	53.47	345	4.84



Please note that the journals Langmuir and Chemistry Materials were launched in the year 1985 and 1989 respectively. These journals do not reflect citation frequency for the entire period starting 1975