

# References

ADF Program System  
Release 2002.03

SCIENTIFIC COMPUTING & MODELLING NV  
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December 11, 2002

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## GENERAL REFERENCES

When you publish results in the scientific literature that were obtained with programs of the ADF package, you are required to include references to the program package with the appropriate release number, and a few key publications:

For calculations with the molecular ADF code, version 2002.03:

- 1 G. te Velde, F.M. Bickelhaupt, S.J.A. van Gisbergen, C. Fonseca Guerra, E.J. Baerends, J.G. Snijders, T. Ziegler, "Chemistry with ADF", *J. Comput. Chem.* **22**, 931-967 (2001)
- 2 C Fonseca Guerra, J G Snijders, G te Velde, and E J Baerends, *Theor. Chem. Acc.* **99**, 391 (1998)
- 3 ADF2002.03, SCM, Theoretical Chemistry, Vrije Universiteit, Amsterdam, The Netherlands, <http://www.scm.com>

Optionally, you may add the following list of authors:

E. J. Baerends, J.A. Autschbach, A. Bércecs, C. Bo, P. M. Boerrigter, L. Cavallo, D.P. Chong, L. Deng, R. M. Dickson, D. E. Ellis, L. Fan, T. H. Fischer, C. Fonseca Guerra, S. J. A. van Gisbergen, J. A. Groeneveld, O. V. Gritsenko, M. Grüning, F. E. Harris, P. van den Hoek, H. Jacobsen, G. van Kessel, F. Kootstra, E. van Lenthe, V. P. Osinga, S. Patchkovskii, P. H. T. Philipsen, D. Post, C. C. Pye, W. Ravenek, P. Ros, P. R. T. Schipper, G. Schreckenbach, J. G. Snijders, M. Sola, M. Swart, D. Swerhone, G. te Velde, P. Vernooijs, L. Versluis, O. Visser, E. van Wezenbeek, G. Wiesenekker, S. K. Wolff, T. K. Woo, and T. Ziegler

Note: if you have used a modified (by yourself, for instance) version of the code, you should mention in the citation that a modified version has been used.

For calculations with the periodic structures BAND code, version 2002.03:

- 1 G te Velde and E J Baerends, *Phys. Rev B* **44**, 7888 (1991)
- 2 G Wiesenekker and E J Baerends, *J. of Phys.: Condensed Matter* **3**, 6721 (1991)
- 3 BAND2002.03, SCM, Theoretical Chemistry, Vrije Universiteit, Amsterdam, The Netherlands, <http://www.scm.com>

Optionally, you may add the following list of authors:

G. te Velde, E.J. Baerends, P.H.T. Philipsen, G. Wiesenekker, J.A. Groeneveld, F. Kootstra, P.L. de Boeij, J.G. Snijders

Note: if you have used a modified (by yourself, for instance) version of the code, you should mention in the citation that a modified version has been used.

In addition to these general references, references to special features are mandatory, in case you have used them. See below for details.

## FEATURE REFERENCES

When you have used special features, you should include one (or more, as the case may be) lead reference(s) to the implementation. Additional references to related publications are suggested.

## FREQUENCIES, IR INTENSITIES

(Using Numerical Differentiation of First Derivatives of the Energy)

L Fan and T Ziegler, *J. Chem. Phys.* **96**, 9005 (1992)

L Fan and T Ziegler, *J. Phys. Chem.* **96**, 6937 (1992)

## TRANSITION STATE SEARCH

L Versluis and T Ziegler, *J. Chem. Phys.* **322**, 88 (1988)

L Fan and T Ziegler, *J. Am. Chem. Soc.* **114**, 10890 (1992)

## ANALYTICAL SECOND DERIVATIVES (SD PROGRAM)

A Bérces, R M Dickson, L Fan, H Jacobsen, D Swerhone, and T Ziegler, *Comput. Phys. Commun.* **100**, 247 (1997)

H Jacobsen, A Bérces, D P Swerhone, and T Ziegler, *Comput. Phys. Commun.* **100**, 263 (1997)

S.K. Wolff, unpublished

## IRC

L Deng and T Ziegler, *J. Chem. Phys.* **99**, 3823 (1993)

L Deng and T Ziegler, *Int. J. Quantum Chem.* **52**, 731 (1994)

## ADF-BAND: PERIODIC SYSTEMS

Lead

See key references above, for all work with BAND

Suggested

G Wiesenekker, G te Velde, and E J Baerends, *J. Phys. C: Solid State Phys.* **21**, 4263 (1988)

G te Velde and E J Baerends, *J. Comput. Phys.* **99** (1), 84 (1992)

## TDDFT IN ADF-BAND: PERIODIC SYSTEMS

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F. Kootstra, P. L. de Boeij, and J. G. Snijders, *J. Chem. Phys.* **112**, 6517 (2000).

F. Kootstra, P. L. de Boeij, and J. G. Snijders, *Phys. Rev. B* **62**, 7071 (2000).

Suggested journal references

F. Kootstra, P. L. de Boeij, H. Aissa, and J. G. Snijders, *J. Chem. Phys.* **114**, 1860 (2001).  
P. L. de Boeij, F. Kootstra, and J. G. Snijders, *Int. J. Quantum Chem.* **85**, 449 (2001).  
P. L. de Boeij, F. Kootstra, J. A. Berger, R. van Leeuwen, and J. G. Snijders, *J. Chem. Phys.* **115**, 1995 (2001).

#### Suggested book references

F. Kootstra, Ph.D. thesis, Rijksuniversiteit Groningen, Groningen (2001).  
F. Kootstra, P. L. de Boeij, R. van Leeuwen, and J. G. Snijders, in 'Reviews of modern quantum chemistry', a celebration of the contributions of Robert G. Parr, Editor K. D. Sen, World Scientific, Singapore, 2002.

## SOLVENT EFFECTS

C C Pye and T Ziegler, *Theor. Chem. Acc.* **101**, 396 (1999)

## QM/MM

#### Lead

T K Woo, L Cavallo, and T Ziegler, *Theor. Chem. Acc.* **100**, 307 (1998)

#### Suggested

T K Woo, S Patchkovskii, and T Ziegler, *Computing in Science & Engineering*, 2000, November/December, 28-37

#### For AddRemove model

M. Swart, *Int. J. Quant. Chem.*, in press (2003)

## RELATIVISTIC CORRECTIONS

## ZORA

#### Lead references

E van Lenthe, E J Baerends, and J G Snijders, *J. Chem. Phys.* **99**, 4597 (1993)  
E van Lenthe, E J Baerends, and J G Snijders, *J. Chem. Phys.* **101**(11), 9783 (1994)  
E van Lenthe, AE Ehlers, and E J Baerends, *J. Chem. Phys.* **110**, 8943 (1999)

#### Suggested related references

E van Lenthe, J G Snijders, and E J Baerends, *J. Chem. Phys.* **105**(15), 6505 (1996)  
E van Lenthe, R van Leeuwen, E J Baerends, and J G Snijders, *Int. J. Quantum Chem.* **57**, 281 (1996)

## Pauli

#### Lead references

J G Snijders, E J Baerends, and P Ros, *Mol. Phys.* **38**, 1909 (1979)  
P M Boerrigter, E J Baerends, J G Snijders, *Chem. Phys.* **122**, 357 (1988)  
T Ziegler, V Tschinke, E J Baerends, J G Snijders, W Ravenek, *J. Phys. Chem.* **93**, 3050 (1989)

## **BOND ENERGY ANALYSIS**

T Ziegler and A Rauk, *Inorg. Chem.* **18**, 1558 (1979)

T Ziegler and A Rauk, *Inorg. Chem.* **18**, 1755 (1979)

F M Bickelhaupt and E J Baerends, In: *Rev. Comput. Chem.*; K B Lipkowitz and D B Boyd, Eds.; Wiley, New York, 2000, Vol. 15, p.1-86

## **TIME-DEPENDENT DFT: RESPONSE PROPERTIES**

For all Time-Dependent DFT features (Excitation Energies, (Hyper) Polarizabilities, Dispersion Coefficients, Raman Scattering, include:

S J A van Gisbergen, J G Snijders, and E J Baerends, *Comput. Phys. Commun.* **118**, 119, (1999)

### **Excitation Energies and Oscillator Strengths**

Lead reference

S J A van Gisbergen, J G Snijders, and E J Baerends, *Comput. Phys. Commun.* **118**, 119 (1999)

Suggested (when ZORA relativistic results are used)

A Rosa, E J Baerends, S J A van Gisbergen, E van Lenthe, J A Groeneveld, and J G Snijders, *J. Am. Chem. Soc.* **121**, 10356 (1999)

### **Polarizabilities**

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S J A van Gisbergen, J G Snijders, and E J Baerends, *J. Chem. Phys.* **103**, 9347 (1995)

Suggested

V P Osinga, S J A van Gisbergen, J G Snijders, and E J Baerends, *J. Chem. Phys.* **106**, 5091 (1997)

### **Hyperpolarizabilities**

Lead

S J A van Gisbergen, J G Snijders, and E J Baerends, *J. Chem. Phys.* **109**, 10644 (1998)

Suggested:

S J A van Gisbergen, J G Snijders, and E J Baerends, *Phys. Rev. Lett.* **78**, 3097 (1997)

### **Dispersion Coefficients**

Lead

V P Osinga, S J A van Gisbergen, J G Snijders, and E J Baerends, *J. Chem. Phys.* **106**, 5091 (1997)

Suggested

S J A van Gisbergen, J G Snijders, and E J Baerends, *J. Chem. Phys.* **103**, 9347 (1995)

### **Raman Scattering**

S J A van Gisbergen, J G Snijders, and E J Baerends, *Chem. Phys. Lett.* **259**, 599 (1996)

## ESR PARAMETERS

### G-tensor: Zeeman interaction

Lead reference

E. van Lenthe, A. van der Avoird, and P.E.S. Wormer, *J Chem Phys* **107**, 2488 (1997)

### A-tensor: Nuclear magnetic dipole hyperfine interaction

Lead reference

E. van Lenthe, A. van der Avoird, and P.E.S. Wormer, *J Chem Phys* **108**, 4783 (1998)

## ELECTRIC FIELD GRADIENT, NQCC

Lead reference (in ESR called Q-tensor: Nuclear electric quadrupole hyperfine interaction)

E. van Lenthe and E. . Baerends, *J. Chem. Phys* **112**, 8279-8292 (2000)

## NMR CHEMICAL SHIFTS

Lead reference

G Schreckenbach and T Ziegler, *J. Phys. Chem.* **99**, 606 (1995)

Suggested

G Schreckenbach and T Ziegler, *Int. J. Quantum Chem.* **60**, 753 (1996)

G Schreckenbach and T Ziegler, *Int. J. Quantum Chem.* **61**, 899 (1997)

S K Wolff and T Ziegler, *J. Chem. Phys.* **109**, 895 (1998)

S K Wolff, T Ziegler, E van Lenthe, and E J Baerends, *J. Chem. Phys.* **110**, 7689 (1999)

## NMR SPIN-SPIN COUPLING

Lead

J.A. Autschbach and T. Ziegler, *J. Chem. Phys.* **113**, 936 (2000)

J.A. Autschbach and T. Ziegler, *J. Chem. Phys.* **113**, 9410 (2000)

Suggested

R M Dickson and T Ziegler, *J. Phys. Chem.* **100**(13), 5286 (1996)

J Khandogin and T Ziegler, *Spectrochimica Acta* **55**, 607 (1999)

J. Autschbach, T. Ziegler, *J. Am. Chem. Soc.* **123**, 3341 (2001)

J. Autschbach, T. Ziegler, *J. Am. Chem. Soc.* **123**, 5320 (2001)

## EPR/NMR PROGRAM

Lead

G. Schreckenbach and Tom Ziegler *J. Phys. Chem. A* 1997, **101**, 3388 (for ESR g-tensor)

S. Patchkovskii and Tom Ziegler *J. Phys. Chem. A* 2001, **105**, 5490 (for high-spin EPR g-tensor)

