

Supplementary material (Olofsson-Mårtensson, Kritikos and Noréus)

JA991047R

Table of experimental χ_M values of Ba_2PdH_4 .

(The experimental susceptibility data are corrected for sampleholder diamagnetism and for core electron diamagnetism using Pascal's constants.)

T (K)	χ_M ($\text{m}^3 \cdot \text{mol}^{-1}$)	T (K)	χ_M ($\text{m}^3 \cdot \text{mol}^{-1}$)
1.189E+1	-5.455E-9	6.421E+1	-2.284E-8
1.215E+1	-7.111E-9	6.740E+1	-2.285E-8
1.276E+1	-5.473E-9	7.093E+1	-2.366E-8
1.338E+1	-6.463E-9	7.448E+1	-2.413E-8
1.410E+1	-7.441E-9	7.828E+1	-2.490E-8
1.480E+1	-3.182E-9	8.230E+1	-2.276E-8
1.559E+1	-1.432E-8	8.653E+1	-2.302E-8
1.636E+1	-8.512E-9	9.001E+1	-2.558E-8
1.720E+1	-1.112E-8	9.453E+1	-2.693E-8
1.805E+1	-7.867E-9	9.936E+1	-2.707E-8
1.904E+1	-8.615E-9	1.045E+2	-1.936E-8
1.982E+1	-1.317E-8	1.097E+2	-1.586E-8
2.084E+1	-5.118E-9	1.153E+2	-2.051E-8
2.192E+1	-1.064E-8	1.213E+2	-2.242E-8
2.297E+1	-1.041E-8	1.273E+2	-2.352E-8
2.401E+1	-1.230E-8	1.339E+2	-1.776E-8
2.513E+1	-1.261E-8	1.408E+2	-1.778E-8
2.629E+1	-1.212E-8	1.465E+2	-1.730E-8
2.772E+1	-1.821E-8	1.529E+2	-1.650E-8
2.924E+1	-1.286E-8	1.618E+2	-1.860E-8
3.073E+1	-1.531E-8	1.702E+2	-1.592E-8
3.208E+1	-1.049E-8	1.788E+2	-1.588E-8
3.383E+1	-1.402E-8	1.881E+2	-1.672E-8
3.542E+1	-1.826E-8	1.976E+2	-1.704E-8
3.736E+1	-1.761E-8	2.077E+2	-2.301E-8
3.939E+1	-2.347E-8	2.183E+2	-2.547E-8
4.131E+1	-1.661E-8	2.294E+2	-2.116E-8
4.358E+1	-2.173E-8	2.411E+2	-2.882E-8
4.568E+1	-1.984E-8	2.512E+2	-2.590E-8
4.806E+1	-1.360E-8	2.637E+2	-2.726E-8
5.058E+1	-2.824E-8	2.774E+2	-2.724E-8
5.314E+1	-2.033E-8	2.915E+2	-2.621E-8
5.522E+1	-1.830E-8	3.064E+2	-2.996E-8
5.812E+1	-2.314E-8	3.221E+2	-3.142E-8
6.110E+1	-2.557E-8		

cont. →

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_cell_volume          466.9(3)
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_exptl_crystal_F_000       648
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Refinement on F^2 for ALL reflections except for 0 with very negative F^2 or flagged by the user for potential systematic errors. Weighted R-factors wR and all goodnesses of fit S are based on F^2 , conventional R-factors R are based on F , with F set to zero for negative F^2 . The observed criterion of $F^2 > 2\sigma(F^2)$ is used only for calculating $R_{\text{factor_obs}}$ etc. and is not relevant to the choice of reflections for refinement. R-factors based on F^2 are statistically about twice as large as those based on F , and R-factors based on ALL data will be even larger.

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_atom_sites_solution_secondary difmap
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All esds (except the esd in the dihedral angle between two l.s. planes) are estimated using the full covariance matrix. The cell esds are taken into account individually in the estimation of esds in distances, angles and torsion angles; correlations between esds in cell parameters are only used when they are defined by crystal symmetry. An approximate (isotropic) treatment of cell esds is used for estimating esds involving l.s. planes.

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'x, y, z'
'-x+1/2, -y, z+1/2'
'x+1/2, -y+1/2, -z+1/2'
'-x, y+1/2, -z'
'-x, -y, -z'
'x-1/2, y, -z-1/2'
'-x-1/2, y-1/2, z-1/2'
'x, -y-1/2, z'

_cell_length_a              7.5884(18)
_cell_length_b              5.5095(18)
_cell_length_c              9.694(2)
_cell_angle_alpha           90.00

```

```

_cell_angle_beta          90.00
_cell_angle_gamma         90.00
_cell_volume              405.28(19)
_cell_formula_units_Z      4
_cell_measurement_temperature 293(2)
_cell_measurement_reflns_used 397
_cell_measurement_theta_min 10.8
_cell_measurement_theta_max 51.7

_exptl_crystal_description 'Irregular'
_exptl_crystal_colour      'Red violet'
_exptl_crystal_size_max    0.32
_exptl_crystal_size_mid    0.15
_exptl_crystal_size_min    0.10
_exptl_crystal_density_meas ?
_exptl_crystal_density_diffn 4.682
_exptl_crystal_density_method 'not measured'
_exptl_crystal_F_000       504
_exptl_absorpt_coefficient_mu 30.362
_exptl_absorpt_correction_type Numerical
_exptl_absorpt_correction_T_min 0.0267
_exptl_absorpt_correction_T_max 0.0666
_exptl_absorpt_process_details ?

_exptl_special_details
;
?
;

_diffn_ambient_temperature 293(2)
_diffn_radiation_wavelength 0.71073
_diffn_radiation_type       MoK\alpha
_diffn_radiation_source     'fine-focus sealed tube'
_diffn_radiation_monochromator graphite
_diffn_measurement_device_type 'Stoe-IPDS'
_diffn_measurement_method    'Stoe-IPDS image-plate'
_diffn_detector_area_resol_mean 6.7
_diffn_standards_number     ?
_diffn_standards_interval_count ?
_diffn_standards_interval_time ?
_diffn_standards_decay_%    ?
_diffn_reflns_number        1900
_diffn_reflns_av_R_equivalents 0.1357
_diffn_reflns_av_sigmaI/netI 0.0487
_diffn_reflns_limit_h_min   -9
_diffn_reflns_limit_h_max    8
_diffn_reflns_limit_k_min   -6
_diffn_reflns_limit_k_max    6

```

```

_diffrn_reflms_limit_l_min    -11
_diffrn_reflms_limit_l_max    11
_diffrn_reflms_theta_min     3.41
_diffrn_reflms_theta_max     26.00
_reflms_number_total          402
_reflms_number_gt             353
_reflms_threshold_expression   > 2sigma(I)

_computing_data_collection    'EXPOSE by Stoe & Cie (1997)'
_computing_cell_refinement    'SELECT by Stoe & Cie (1997)'
_computing_data_reduction     'INTEGRATE by Stoe & Cie (1997)'
_computing_structure_solution 'SHELXS-97 (Sheldrick, 1990)'
_computing_structure_refinement 'SHELXL-97 (Sheldrick, 1997)'
_computing_molecular_graphics 'PLATON98 (Spek, 1990), ATOMS(Dowty, 1997)'
_computing_publication_material 'PLATON98'

```

```
_refine_special_details
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```
;
```

Refinement of F^2 against ALL reflections. The weighted R-factor wR and goodness of fit S are based on F^2 , conventional R-factors R are based on F, with F set to zero for negative F^2 . The threshold expression of $F^2 > 2\sigma(F^2)$ is used only for calculating R-factors(gt) etc. and is not relevant to the choice of reflections for refinement. R-factors based on F^2 are statistically about twice as large as those based on F, and R-factors based on ALL data will be even larger.

```
;
```

```

_refine_ls_structure_factor_coef Fsqd
_refine_ls_matrix_type          full
_refine_ls_weighting_scheme     calc
_refine_ls_weighting_details
'calc w=1/[\s^2*(Fo^2)+(0.1282P)^2+17.0159P] where P=(Fo^2+2Fc^2)/3'
_atom_sites_solution_primary    direct
_atom_sites_solution_secondary  difmap
_atom_sites_solution_hydrogens  geom
_refine_ls_hydrogen_treatment   mixed
_refine_ls_extinction_method     SHELXL
_refine_ls_extinction_coef       0.000(3)
_refine_ls_extinction_expression
'Fc**^=kFc[1+0.001xFc^2\l^3^/sin(2\q)]^-1/4^'
_refine_ls_number_reflms        402
_refine_ls_number_parameters     20
_refine_ls_number_restraints     0
_refine_ls_R_factor_all          0.0784
_refine_ls_R_factor_gt           0.0666
_refine_ls_wR_factor_ref         0.2156
_refine_ls_wR_factor_gt          0.1561
_refine_ls_goodness_of_fit_ref   1.223

```

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_refine_ls_restrained_S_all      1.223
_refine_ls_shift/su_max          1.908
_refine_ls_shift/su_mean         0.245

```

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  _atom_site_fract_x
  _atom_site_fract_y
  _atom_site_fract_z
  _atom_site_U_iso_or_equiv
  _atom_site_adp_type
  _atom_site_occupancy
  _atom_site_symmetry_multiplicity
  _atom_site_calc_flag
  _atom_site_refinement_flags
  _atom_site_disorder_assembly
  _atom_site_disorder_group
Sr1 Sr 0.3496(3) 0.2500 0.0923(2) 0.0043(9) Uani 1 2 d S . .
Pd1 Pd 0.2603(2) 0.2500 0.41626(18) 0.0031(9) Uani 1 2 d S . .
Sr2 Sr 0.0090(3) 0.2500 -0.1705(2) 0.0028(9) Uani 1 2 d S . .

```

```

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  _atom_site_aniso_U_11
  _atom_site_aniso_U_22
  _atom_site_aniso_U_33
  _atom_site_aniso_U_23
  _atom_site_aniso_U_13
  _atom_site_aniso_U_12
Sr1 0.0064(14) 0.0000(12) 0.0065(13) 0.000 -0.0002(8) 0.000
Pd1 0.0039(14) 0.0000(11) 0.0054(12) 0.000 -0.0015(5) 0.000
Sr2 0.0027(15) 0.0000(12) 0.0056(12) 0.000 0.0008(7) 0.000

```

```
_geom_special_details
```

```

;
All esds (except the esd in the dihedral angle between two l.s. planes)
are estimated using the full covariance matrix. The cell esds are taken
into account individually in the estimation of esds in distances, angles
and torsion angles; correlations between esds in cell parameters are only
used when they are defined by crystal symmetry. An approximate (isotropic)
treatment of cell esds is used for estimating esds involving l.s. planes.
;

```

```

loop_
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  _geom_bond_atom_site_label_2
  _geom_bond_distance

```

_geom_bond_site_symmetry_2

_geom_bond_publ_flag

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Sr1 Pd1 3.213(3) . ?

Sr1 Pd1 3.3462(18) 2_554 ?

Sr1 Pd1 3.3462(18) 2_564 ?

Sr1 Sr2 3.630(3) . ?

Sr1 Sr2 3.745(2) 2_565 ?

Sr1 Sr2 3.745(2) 2 ?

Sr1 Sr2 3.946(2) 5 ?

Sr1 Sr2 3.946(2) 5_565 ?

Sr1 Sr1 4.000(3) 5_665 ?

Sr1 Sr1 4.000(3) 5_655 ?

Sr1 Sr2 4.264(3) 6_655 ?

Pd1 Sr2 3.104(3) 6_656 ?

Pd1 Sr1 3.117(3) 6_556 ?

Pd1 Sr1 3.3462(18) 2_565 ?

Pd1 Sr1 3.3462(18) 2 ?

Pd1 Sr2 3.3709(17) 2_565 ?

Pd1 Sr2 3.3709(17) 2 ?

Sr2 Pd1 3.104(3) 6_556 ?

Sr2 Pd1 3.3709(17) 2_564 ?

Sr2 Pd1 3.3709(17) 2_554 ?

Sr2 Sr1 3.745(2) 2_554 ?

Sr2 Sr1 3.745(2) 2_564 ?

Sr2 Sr1 3.946(2) 5 ?

Sr2 Sr1 3.946(2) 5_565 ?

Sr2 Sr2 4.0954(18) 6 ?

Sr2 Sr2 4.0954(18) 6_655 ?

Sr2 Sr1 4.264(3) 6 ?

Sr2 Sr2 4.305(3) 5_565 ?

loop_

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_geom_angle_atom_site_label_2

_geom_angle_atom_site_label_3

_geom_angle

_geom_angle_site_symmetry_1

_geom_angle_site_symmetry_3

_geom_angle_publ_flag

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Pd1 Sr1 Pd1 103.62(6) 6_656 2_554 ?

Pd1 Sr1 Pd1 116.48(5) . 2_554 ?

Pd1 Sr1 Pd1 103.62(6) 6_656 2_564 ?

Pd1 Sr1 Pd1 116.48(5) . 2_564 ?

Pd1 Sr1 Pd1 110.82(9) 2_554 2_564 ?

Pd1 Sr1 Sr2 133.89(8) 6_656 . ?

Pd1 Sr1 Sr2 122.39(8) ... ?

Pd1 Sr1 Sr2 57.62(5) 2_554 . ?
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 Pd1 Sr1 Sr2 171.91(7) 2_554 2_565 ?
 Pd1 Sr1 Sr2 77.23(4) 2_564 2_565 ?
 Sr2 Sr1 Sr2 129.42(4) . 2_565 ?
 Pd1 Sr1 Sr2 74.33(5) 6_656 2 ?
 Pd1 Sr1 Sr2 57.34(4) . 2 ?
 Pd1 Sr1 Sr2 77.23(4) 2_554 2 ?
 Pd1 Sr1 Sr2 171.91(7) 2_564 2 ?
 Sr2 Sr1 Sr2 129.42(4) . 2 ?
 Sr2 Sr1 Sr2 94.70(7) 2_565 2 ?
 Pd1 Sr1 Sr2 133.99(4) 6_656 5 ?
 Pd1 Sr1 Sr2 70.53(5) . 5 ?
 Pd1 Sr1 Sr2 49.55(4) 2_554 5 ?
 Pd1 Sr1 Sr2 120.06(7) 2_564 5 ?
 Sr2 Sr1 Sr2 69.12(5) . 5 ?
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 Pd1 Sr1 Sr1 123.91(7) . 5_655 ?
 Pd1 Sr1 Sr1 49.23(4) 2_554 5_655 ?
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 Sr2 Sr1 Sr1 95.30(7) . 5_655 ?
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 Sr2 Sr1 Sr1 163.79(9) 5_565 5_655 ?
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 Sr1 Pd1 Sr1 76.38(6) 6_556 2 ?
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