

CHEMICAL TRENDS AND UNIVERSALITIES IN THE SPECTRA OF

TRANSITION METAL IMPURITIES IN SEMICONDUCTORS



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fixed configuration (say, $\langle m, n \rangle$) contains the average energy $\hat{E}_{(A, B, C)}$ of all single-configuration energies that evolve from $\langle m, n \rangle$. Here, 'A' is the isotropic t -tolyne-symmetric interelectronic repulsion, and 'B', 'C' are the anisotropic contributions due to the spin-orbit coupling and the electron correlation function.

Incorporate explicitly the separation of average MF effects from multibody corrections.

This general formalism can be applied in two ways. First, one could compute from MF wavefunctions all of the symmetry and spin-dependent anisotropic many-electron integrals underlying $\Delta_{(1)}^{(1)}(m, n; m', n')$, as well as the MF energy separations $\Delta_{(0)}(m, n; m', n')$, and insert them into their the general matrix equations (1) to obtain the multiplet spectra and MF vs MC components. Alternatively, one may wish to establish the magnetic dipole moment and transition dipole moment by calculating the expectation values of the corresponding operators themselves, using the integrals of the theory as 'internal' parameters. In this view, it is itself, using the integrals of the theory as 'internal' parameters, that one must calculate the energy differences between the different multiplets and orbitals by the, $\Delta E_{MF} = \langle \Psi_0 | \hat{H} | \Psi_0 \rangle - \langle \Psi_1 | \hat{H} | \Psi_1 \rangle$, difference from (3), measuring the ratio of the interelectronic interactions

es of the JT and ST ions is the no. of donor
the actual nuclear configuration space for the

$E_D^N(U)$ $= \frac{N(N-1)}{MF} + \frac{N(N-1)}{MC}$, (1)
for electrons, the z-axis rays, the initially,
for scattering with the initial state of the
for donors. Finally, $N_{MF} = \frac{N}{MF}$, $N_{MC} = \frac{N}{MC}$

in MU's for the ground state
transitions energies in '11-v's' ΔE_{MF}
transition we must have a separation

$$\Delta E_{(1)}^{(1)}(U) = \frac{N(N+1)}{MF} + \frac{N(N+1)}{MC}$$

where the central interaction ΔE_{MF}

$$= \frac{N(N+1)}{MF} + \frac{N(N+1)}{MC}$$

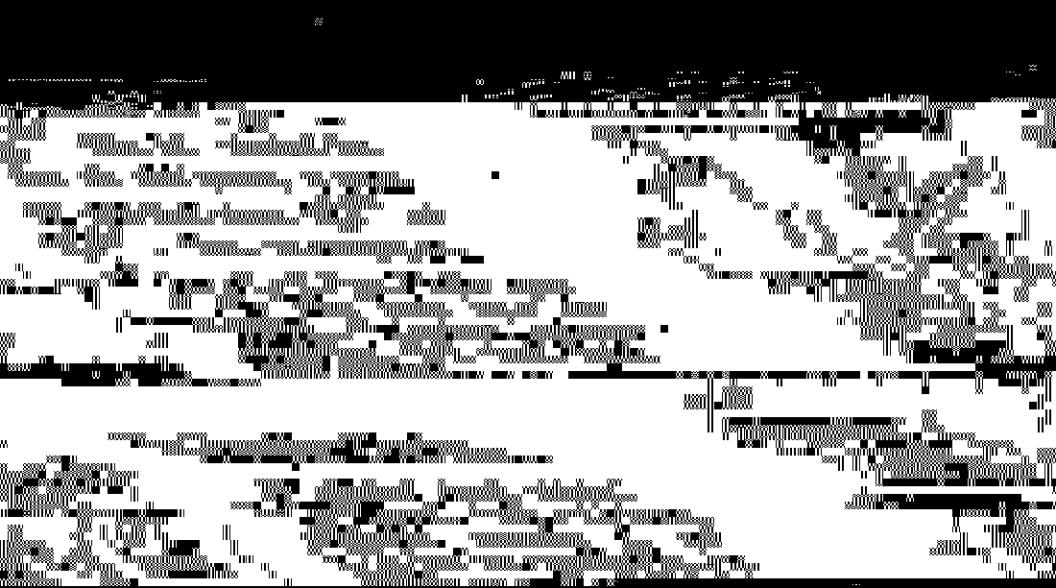
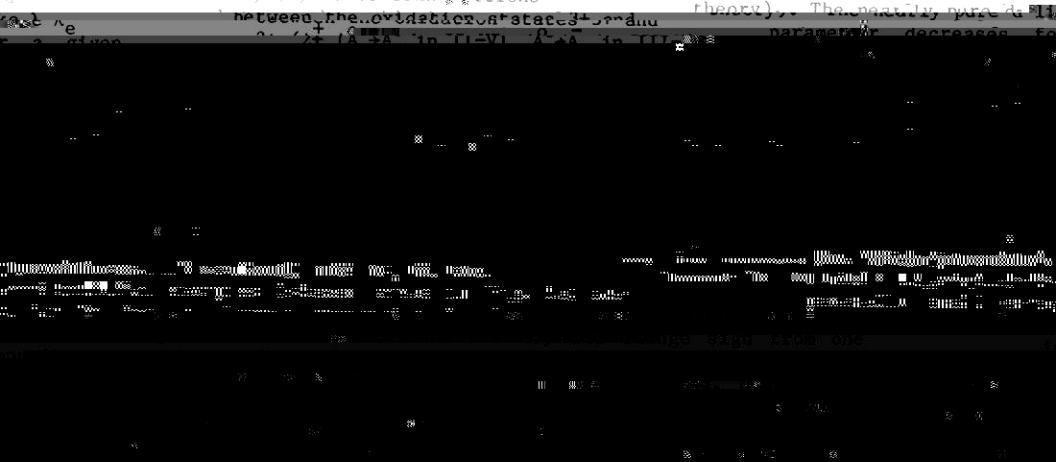


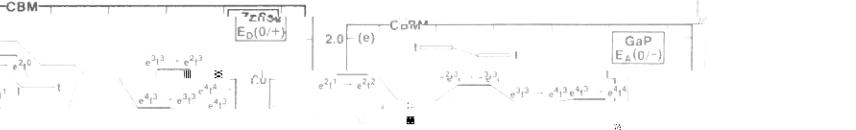
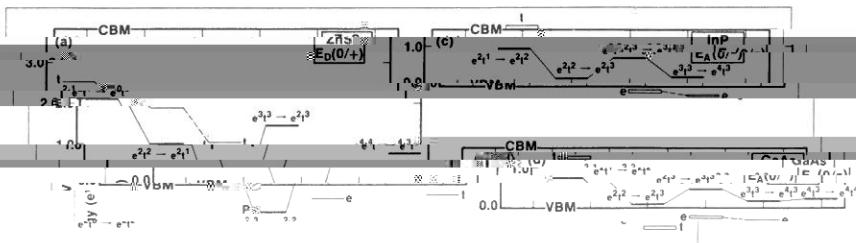
Fig. 1. Calculated energy levels for the first high-spin transition in Co^{2+} Ni^{2+} clusters (number of bonds with nearest neighbors), and comparison between calculations in the multiplet limit and impurity within a class of configurations in Co^{2+} Ni^{2+} clusters. The number of states per unit cell is shown at the first high-spin transition.

Fig. 1. Calculated energy levels for the first high-spin transition in Co^{2+} Ni^{2+} clusters (number of bonds with nearest neighbors), and comparison between calculations in the multiplet limit and impurity within a class of configurations in Co^{2+} Ni^{2+} clusters. The number of states per unit cell is shown at the first high-spin transition.

ground state of the $2t$ oxidation state; (c) MC to transitions

with the point-ion crystal field theory). The partially pure d_{10} parameter decreases for





and ΔE_{exc} for the same class within a given class. **Fourth**, in contrast to $d+d^*$ excitations, the calculations for acceptor states (Fig. 1c) are carried out by the "physically transparent" energy scale of the band diagram, involving non-local contributions.

The magnitude of the MF effects are comparable to MF effects. The changes of ΔE_{exc} between P_0 and M_0



-- ~~an example of many of the characteristics of deep impurities~~
~~according to the solid state people - some universality -~~
12-V command and control

conventionally. Simulations performed in the framework of the WKB approximation and the
the semi-classical theory show that the energy level is more regular in the regular than in the chaotic, fluctuating state.
the well known situation in which ergodic classes where regular islands of regular motion coexist with chaotic motion.

The negative or positive coupling to the environment

the metastability of the latter. In particular

(2a). Using the same numbers as above, this means

$E_A(0/-)$ transition in Eq

that $\Delta E^{4,5} \lesssim 1.6$ eV. Recent MFL calculations (9a) show that this is also true for GaP:Mn, but could be the case for GaP:Fe, too, but this is not the case for GaP:Mn, but could be the case for GaP:Fe, too.

