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Graphical Abstracts/J. Fluorine Chem. 166 (2014) v–x

$HBF_4 \cdot OEt_2$: An efficient fluorinated acid catalyst for the one-pot synthesis of secondary and tertiary *N*-homoallylic carbamates

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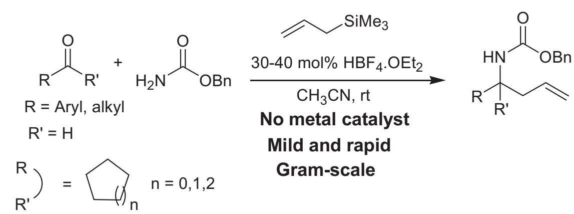
● $HBF_4.OEt_2$ is used as a catalyst for the first time in this reaction. ● $HBF_4.OEt_2$ is used as superior alternative to metal triflates and other catalysts. ● The broad substrates compatibility of $HBF_4.OEt_2$ makes this method more useful. ● This method is operationally simple and easily scalable. ● A mechanism is also proposed by showing the catalytic involvement of $HBF_4.OEt_2$.



Quantum chemical calculation of ^{19}F NMR chemical shifts of trifluoromethyl diazirine photoproducts and precursors

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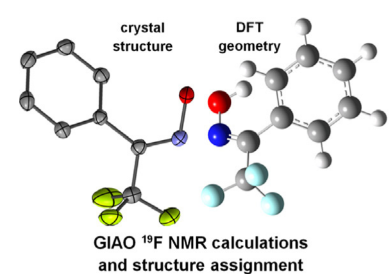
● Quantum chemical prediction of ^{19}F NMR spectra. ● *E/Z* assignment of oximes via ^{19}F NMR spectroscopy. ● ^{19}F NMR reference table of CF_3 groups associated with photoaffinity labeling.



Synthesis and characterization of new hydroxylammonium fluoromanganates and fluoroscandates

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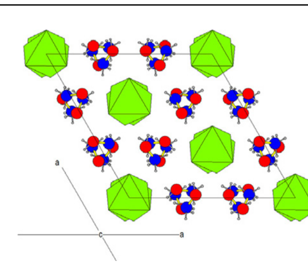
● New hydroxylammonium fluorometallates with the formulas $(NH_3OH)_2MnF_4$ and $(NH_3OH)_3ScF_6$, were prepared in aqueous HF. ● $(NH_3OH)_2MnF_4$ crystallizes monoclinic, $P2_1/c$, the structure consisting of $[MnF_4^2]n$ anionic layers perpendicular to *a* axis. ● $(NH_3OH)_3ScF_6$ crystallizes trigonal, *R*3*c*, with isolated ScF_6 octahedra, surrounded by hydroxylammonium cations. ● Both compounds decompose during thermal analysis in several steps, yielding corresponding fluorides (MnF_2 and ScF_3).



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Surface fluorination effects on TiAl particle oxidation resistance

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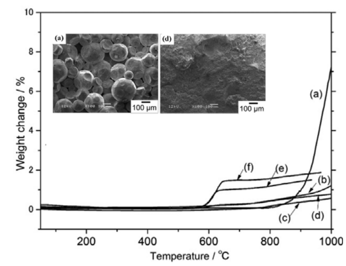

● Surface fluorination of TiAl alloy particles was conducted at 25–200 °C with F_2 gas. ● Below 125 °C, an oxyfluoride layer on TiAl particles was made from the oxide layer. ● At more than 150 °C, the fluoride layer on TiAl was made from the oxyfluoride layer. ● Fluorinated TiAl oxidation resistance can be 10 times that of untreated material.

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Studies of the products from the reactions of co-acids containing concentrated HF and dilute HNO_3 with Zircaloy-4

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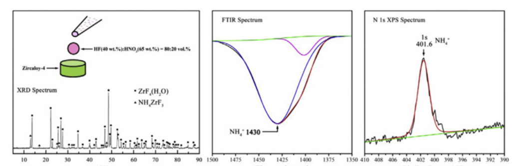

● The co-acid containing HF (40 wt.%) and HNO3 (65 wt.%) with four volume ratios, 100:0, 94:6, 89:11 and 80:20, was used. ● The products from the reactions of HF–HNO_3 system with Zircaloy-4 were identified by XRD, FTIR and XPS synthetically. ● The usage of concentrated HF solution leads to the formation of crystalline $ZrF_4(H_2O)$. ● The usage of co-acids containing HF and HNO_3 leads to the formation of crystalline $ZrF_4(H_2O)$ and NH_4ZrF_5.

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Coupling of trifluoromethyl isocyanide ligands in binuclear iron carbonyl complexes

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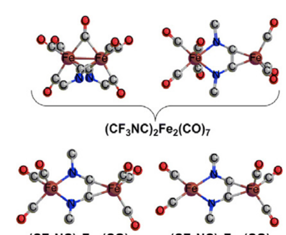

● $(CF_3NC)_2Fe_2(CO)_n$ (n = 7, 6, 5) and $(CF_3NC)Fe(CO)_n$ (n = 4, 3) have been studied by DFT. ● Coupling of CF_3NC ligands is predicted to occur in $(CF_3NC)_2Fe_2(CO)_n$ (n = 6, 5). ● $(CF_3NC)Fe(CO)_4$ has nearly degenerate equatorial and axial trigonal bipyramidal isomers.

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Regioselective synthesis and through-space ^{13}C–^{19}F spin–spin coupling NMR of new tetracyclic 3-(trifluoromethyl)-spiro(chromen[4,3-*c*]pyrazole-4,1′-cycloalkanes)

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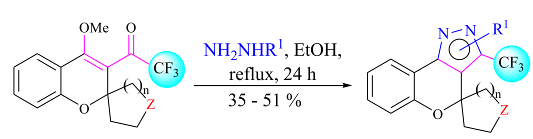

● TFAA in the acylation of spiro[chroman-2,1′-cycloalkan]-4-ones (Kabbe's adducts). ● 3-(Trifluoromethyl)-spirochromen[4,3-c]pyrazole-4,1′-cycloalkanes are synthesized. ● Through-space ^{13}C–^{19}F spin–spin coupling NMR is presented and discussed. ● Structures solved by ^1H, ^{13}C and ^{19}F NMR (spin–spin coupling), MS and X-ray data. ● ^{19}F NMR assigned the trifluoromethyl group position at pyrazole derivatives.