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REACTIONS OF IO_2F_3 WITH XeF_2; A RAMAN STUDY [1]

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The uncontrolled reaction of iodine dioxide difluoride with xenon difluoride is extremely violent, giving $XeF_2 \cdot IF_5$, IO_2F and O_2. However, if the reaction is judiciously controlled by low temperature procedures XeF_2 - IO_2F_3 adducts are produced. Reactions of mixtures of IO_2F_3 and XeF_2 in 1:2, 1:1, 2:1 and 5:1 ratios have been studied and the reaction products monitored by Raman spectroscopy at low temperature. The results suggest that the equilibrium outlined below exists within the system.

With excess of XeF_2

$$[2XeF_2 \cdot Xe_2F_3]^+[I_2O_4F_7]^- \rightleftharpoons 2([Xe_2F_3]^+[IO_2F_4]^-)$$

$$\downarrow$$

With $XeF_2:IO_2F_3$ = 1:1

$$[Xe_2F_3]^+[I_2O_4F_7]^- \rightleftharpoons [XeF_2 \cdot XeF]^+[I_2O_4F_7]^- \rightleftharpoons 2([XeF]^+[IO_2F_4]^-)$$

$$\downarrow$$

With excess of IO_2F_3

$$[XeF]^+[I_2O_4F_7]^-$$

1 D. Laycock, Ph.D. Thesis, University of Leicester, U.K., 1981.