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We present a search for the rare radiative decay $W^\pm \rightarrow \pi^\pm \gamma$ using data corresponding to an integrated luminosity of 4.3 fb^{-1} of proton-antiproton collisions at a center of mass energy of 1.96 TeV collected by the CDF experiment at Fermilab. As no statistically significant signal is observed, we set a 95% confidence level upper limit on the relative branching fraction $\Gamma(W^\pm \rightarrow \pi^\pm \gamma)/\Gamma(W^\pm \rightarrow e^\pm \nu)$ at 6.4×10^{-5} , a factor of 10 improvement over the previous limit.

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Since their discovery by the UA1 [1] and UA2 [2] ex-

*Deceased

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