

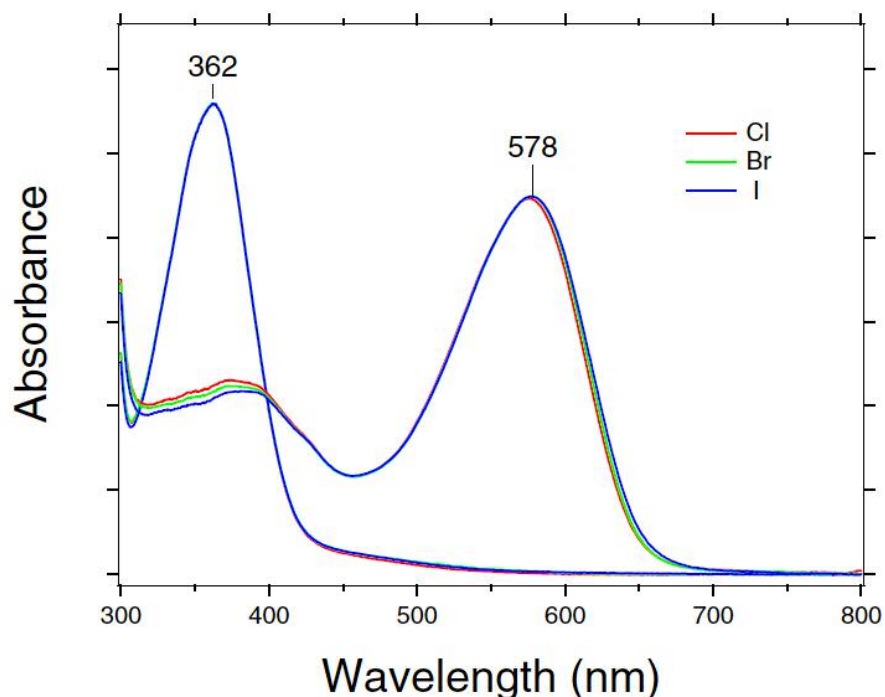
Supporting Information

Ultrafast Pump-Probe Study of the Primary Photoreaction
Process in *pharaonis* Halorhodopsin:
Halide-Ion Dependence and Isomerization Dynamics

Takumi Nakamura, Satoshi Takeuchi, Mikihiro Shibata, Makoto Demura, Hideki Kandori, and

Tahei Tahara*

Figure S1



In the present study, the formation of the K-intermediate was observed as the long-lived component in the ground-state recovery dynamics, and the halide-ion dependence of the relative isomerization yield was evaluated from its amplitude. In this evaluation, it was assumed that the extinction coefficient of the all-*trans* form in the three *pHR* does not depend on the halide ion. The validity of this assumption was checked by the following experiment: The retinyl chromophore of *pHR* was converted into retinal oxime by adding hydroxylamine to the sample solution. Because retinal oxime is detached from *pHR*, the halide-ion dependence is ignorable in the absorption spectra of the retinal oxime. Thus, the absorption spectra of retinal oxime obtained from *pHR*-Cl⁻, *pHR*-Br⁻ and *pHR*-I⁻ could be normalized at the peak position (362 nm), as shown in Figure S1. Using the coefficients obtained from this normalization, we normalized the spectra of *pHR*-Cl⁻, *pHR*-Br⁻ and *pHR*-I⁻ to compare the extinction coefficients of retinyl chromophores. The normalized absorption spectra (peaked at 578 nm) of *pHR*-Cl⁻, *pHR*-Br⁻ and *pHR*-I⁻ are also shown in Figure S1. The spectral intensity and band width did not show any noticeable difference within experimental accuracy, which assured that the halide-ion dependence is ignorable in the extinction coefficient of the all-*trans* form in the ground state.