```cpp
const simulation::Context::SpecieRates simulation::Context::calculateRatesOfChange(){
    const model& _model = _simulation._model;


    CPUGPU_TempArray<RATETYPE, NUM_REACTIONS> reaction_rates;


# 1 "../models/her_model_2014/reactions_list.hpp" 1
# 16 "../models/her_model_2014/reactions_list.hpp"
reaction_rates[mh1_synthesis] = _model.reaction_mh1_synthesis.active_rate(*this);
reaction_rates[mh7_synthesis] = _model.reaction_mh7_synthesis.active_rate(*this);
reaction_rates[mh13_synthesis] = _model.reaction_mh13_synthesis.active_rate(*this);
reaction_rates[md_synthesis] = _model.reaction_md_synthesis.active_rate(*this);
reaction_rates[mh1_degradation] = _model.reaction_mh1_degradation.active_rate(*this);
reaction_rates[mh7_degradation] = _model.reaction_mh7_degradation.active_rate(*this);
reaction_rates[mh13_degradation] = _model.reaction_mh13_degradation.active_rate(*this);
reaction_rates[md_degradation] = _model.reaction_md_degradation.active_rate(*this);
reaction_rates[ph1_synthesis] = _model.reaction_ph1_synthesis.active_rate(*this);
reaction_rates[ph7_synthesis] = _model.reaction_ph7_synthesis.active_rate(*this);
reaction_rates[ph13_synthesis] = _model.reaction_ph13_synthesis.active_rate(*this);
reaction_rates[pd_synthesis] = _model.reaction_pd_synthesis.active_rate(*this);
reaction_rates[ph1_degradation] = _model.reaction_ph1_degradation.active_rate(*this);
reaction_rates[ph7_degradation] = _model.reaction_ph7_degradation.active_rate(*this);
reaction_rates[ph13_degradation] = _model.reaction_ph13_degradation.active_rate(*this);
reaction_rates[pd_degradation] = _model.reaction_pd_degradation.active_rate(*this);
reaction_rates[ph11_association] = _model.reaction_ph11_association.active_rate(*this);
reaction_rates[ph17_association] = _model.reaction_ph17_association.active_rate(*this);
reaction_rates[ph113_association] = _model.reaction_ph113_association.active_rate(*this);
reaction_rates[ph77_association] = _model.reaction_ph77_association.active_rate(*this);
reaction_rates[ph713_association] = _model.reaction_ph713_association.active_rate(*this);
reaction_rates[ph1313_association] = _model.reaction_ph1313_association.active_rate(*this);
reaction_rates[ph11_dissociation] = _model.reaction_ph11_dissociation.active_rate(*this);
reaction_rates[ph17_dissociation] = _model.reaction_ph17_dissociation.active_rate(*this);
reaction_rates[ph113_dissociation] = _model.reaction_ph113_dissociation.active_rate(*this);
reaction_rates[ph77_dissociation] = _model.reaction_ph77_dissociation.active_rate(*this);
reaction_rates[ph713_dissociation] = _model.reaction_ph713_dissociation.active_rate(*this);
reaction_rates[ph1313_dissociation] = _model.reaction_ph1313_dissociation.active_rate(*this);
reaction_rates[ph11_degradation] = _model.reaction_ph11_degradation.active_rate(*this);
reaction_rates[ph17_degradation] = _model.reaction_ph17_degradation.active_rate(*this);
reaction_rates[ph113_degradation] = _model.reaction_ph113_degradation.active_rate(*this);
reaction_rates[ph77_degradation] = _model.reaction_ph77_degradation.active_rate(*this);
reaction_rates[ph713_degradation] = _model.reaction_ph713_degradation.active_rate(*this);
reaction_rates[ph1313_degradation] = _model.reaction_ph1313_degradation.active_rate(*this);
# 59 "context_impl.hpp" 2
```