CLAIMS

1. An information processing device including a processor, wherein

the information processing device executes a step of acquiring an operating parameter regarding a reaction device that performs a predetermined chemical reaction in a process of manufacturing a product and information regarding a substance used in the chemical reaction in the reaction device,

the information processing device executes a step of determining a parameter of a first reaction speed predicted as a reaction speed of the substance when the chemical reaction is performed with the operating parameter in the reaction device,

the information processing device executes a step of quantifying at least one of a plurality of factors by analyzing each of the plurality of factors of the chemical reaction when the chemical reaction is performed with the operating parameter in the reaction device by using a correlation between the parameter of the first reaction speed and each of a plurality of factors that affect the parameter of the first reaction speed in the chemical reaction,

the information processing device executes a step of generating a modified model by modifying a reaction model representing the chemical reaction by using each of the plurality of quantified factors,

the information processing device executes a step of determining a parameter of a third reaction speed predicted as a reaction speed of the substance when the chemical reaction is performed with the operating parameter in the reaction device by using the modified model,

the information processing device executes a step of learning a prediction model that outputs a parameter of a second reaction speed that is a reaction speed of the substance in response to inputting information regarding the substance and the operating parameter, by using the acquired information regarding the substance, the acquired operating parameter and the parameter of a reaction speed as learning data,

the information processing device executes a step of storing the learned prediction model in a storage unit, and

the step of learning is a step of selectively learning the parameter of the first reaction speed or the parameter of the third reaction speed as a parameter of a reaction speed.

2. The information processing device of Claim 1, wherein

the step of quantifying step is a step of quantifying each of the plurality of factors including at least two of a true reaction speed, a speed of substance diffusion, a catalyst adsorption equilibrium and a catalyst activity.

3. An information processing device including a processor, wherein

the information processing device executes a step of acquiring the prediction model learned based on the parameter of the first reaction speed or the parameter of the third reaction speed by the information processing device of Claim 1 or 2,

the information processing device executes a step of accepting input of information regarding the substance and the operating parameter,

the information processing device executes a step of determining a parameter of the second reaction speed by using information regarding the substance, the operating parameter and the prediction model,

the information processing device executes a step of determining a product yield or an index value contributing the product yield by using information regarding the substance, the operating parameter and the parameter of the second reaction speed, and

the information processing device executes a step of outputting the determined product yield or index value contributing the product yield.

4. The information processing device of Claim 1 or 2, wherein

the information processing device executes a step of relearning the prediction model based on an analysis result in response to acquiring the analysis result of an analyzed reaction speed of the substance when the chemical reaction is performed with the operating parameter in the reaction device, and

the information processing device executes a step of storing the relearned prediction model in a storage unit.

5. The information processing device of Claim 1 or 2, wherein

the prediction model is capable of outputting in real time a parameter of the second reaction speed that is a reaction speed of the substance in response to inputting information regarding the substance and the operating parameter.

6. A method for a computer including a processor to execute:

a step of acquiring an operating parameter regarding a reaction device that performs a predetermined chemical reaction in the process of manufacturing a product and information regarding a substance used in the chemical reaction in the reaction device;

a step of determining a parameter of a first reaction speed predicted as a reaction speed of the substance when the chemical reaction is performed with the operating parameter in the reaction device;

a step of quantifying at least one of a plurality of factors by analyzing each of the plurality of factors of the chemical reaction when the chemical reaction is performed with the operating parameter in the reaction device by using a correlation between the parameter of the first reaction speed and each of a plurality of factors that affect the parameter of the first reaction speed in the chemical reaction;

a step of generating a modified model by modifying a reaction model representing the chemical reaction by using each of the plurality of quantified factors;

a step of determining a parameter of the third reaction speed predicted as a reaction speed of the substance when the chemical reaction is performed with the operating parameter in the reaction device by using the modified model;

a step of learning a prediction model that outputs a parameter of a second reaction speed that is a reaction speed of the substance in response to inputting information regarding the substance and the operating parameter by using the acquired information regarding the substance, the acquired operating parameter and the parameter of a reaction speed as learning data; and

a step of storing the learned prediction model in a storage unit, wherein

the step of learning is a step of selectively learning the parameter of the first reaction speed or the parameter of the third reaction speed as a parameter of a reaction speed.

7. A program causing a processor included in a computer to execute:

a step of acquiring an operating parameter regarding a reaction device that performs a predetermined chemical reaction in the process of manufacturing a product and information regarding a substance used in the chemical reaction in the reaction device;

a step of determining a parameter of a first reaction speed predicted as a reaction speed of the substance when the chemical reaction is performed with the operating parameter in the reaction device;

a step of quantifying at least one of a plurality of factors by analyzing each of the plurality of factors of the chemical reaction when the chemical reaction is performed with the operating parameter in the reaction device by using a correlation between the parameter of the first reaction speed and each of a plurality of factors that affect the parameter of the first reaction speed in the chemical reaction;

a step of generating a modified model by modifying a reaction model representing the chemical reaction by using each of the plurality of quantified factors;

a step of determining a parameter of the third reaction speed predicted as a reaction speed of the substance when the chemical reaction is performed with the operating parameter in the reaction device by using the modified model;

a step of learning a prediction model that outputs a parameter of a second reaction speed that is a reaction speed of the substance in response to inputting information regarding the substance and the operating parameter, by using the acquired information regarding the substance, the acquired operating parameter and the parameter of a reaction speed as learning data; and

a step of storing the learned prediction model in a storage unit, wherein

the step of learning is a step of selectively learning the parameter of the first reaction speed or the parameter of the third reaction speed as a parameter of a reaction speed.